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REPORT

OF THE

WATER SUPPLY COMMISSION

OF

PENNSYLVANIA

January 1, 1921, to May 31, 1922.

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1921-22

Water Supply Commission of Pennsylvania

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VICE CHAIRMAN

ROBERT S. CONKLIN, Columbia, Lancaster County

SECRETARY

THOMAS J. LYNCH, Bethlehem, South Side, Northampton County

COMMISSIONER OF FORESTRY

*GIFFORD PINCHOT, Milford, Pike County
(Resigned April 13, 1922)

COMMISSIONER OF HEALTH

EDWARD MARTIN, Media, Delaware County

CHIEF ENGINEER

CHARLES E. RYDER, Harrisburg, Dauphin County

CHIEF CLERK

WILLIAM F. SHERIDAN, Philadelphia, Philadelphia County

---

*ROBERT Y. STUART, Carlisle, Cumberland County
(Appointed April 18, 1922, vice Gifford Pinchot, resigned)

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LETTER OF TRANSMITTAL

Office of the Water Supply Commission,
Harrisburg, June 1, 1922.

His Excellency, the Governor of the Commonwealth of Pennsylvania:

The Members of the Senate and the House of Representatives of the Commonwealth of Pennsylvania:

Gentlemen: The Water Supply Commission of Pennsylvania respectfully submits its report for the period January 1, 1921, to May 31, 1922.

WATER SUPPLY COMMISSION OF PENNSYLVANIA.

THOMAS J. LYNCH,
Secretary.

REPORT

OF THE

Water Supply Commission of Pennsylvania

For the Period

January 1, 1921 To May 31, 1922.

CHAPTER I

The work of the Water Supply Commission during the year 1921 and the first five months of 1922, may be briefly described as follows:

INCORPORATION OF WATER AND WATER POWER COMPANIES

Six applications for the incorporation of Water Supply Companies were approved by the Commission in 1921 and up to May 31, 1922, as shown in the following table. There were no applications approved for Water Power Companies.

TABLE I

Applications for the incorporation of Water Companies

Name	Date of Approval	Territory Covered By Application For Charter
Barr Water Co.	Nov. 22, 1921	Portion of Barr Township, Cambria Co.
Cold Run Water Co.	Apr. 12, 1921	Blythe Township, Schuylkill Co.
Schwenksviille Water Co.	June 28, 1921	Schwenksville Borough, Montgomery Co.
Shavertown Water Co.	Nov. 22, 1921	Portion of Kingston Township, Luzerne County, known as the village of Shavertown.
Brave Water Co.	Mar. 28, 1922	Portion of Wayne Township, Greene Co.
Portage Township Water Co.	May 23, 1922	Portion of Portage Township, Cambria County, known as the village of Jamestown.

The merger of the North Annville Water Supply Company and the Gravel Hill Water Supply Company, into the North Annville & Gravel Hill Consolidated Water Supply Company, was approved by the Commission on January 18, 1921.

SUPERVISION OF DAMS AND OTHER ENCROACHMENTS.

DAMS

The total number of applications received in 1921 and in the first five months of 1922 or from January 1, 1921 to May 31, 1922, for the construction of new dams or for the repair or alteration of existing dams, was 63, of which 51 were for new dams. Fifty-five permits were issued, 41 for the construction of new dams and 14 for the repair or alteration of existing dams. Sixty-seven field examinations were made in connection with applications, either for the purpose of preliminary investigation before issuing permits or for the inspection of construction work in progress. The number of field examinations in connection with existing dams, either original examinations or re-examinations for inspection purposes was 280, making a total of 347 field examinations for the 17 month period. Repairs were ordered on 65 of the dams examined.

A permit was issued to the Spring Brook Water Supply Company for the construction of a dam to be known as the Watres Dam on Spring Brook about nine miles southeast of Scranton. in Spring Brook Township, Lackawanna County. This dam is now under construction and when completed will be the highest dam in the state. It will be 130 feet high and 1400 feet long on top, the reservoir created will cover 164 acres and will hold 1,885,000,000 gallons of water.

The highest and most important dams in the state are built of earth with masonry spillways and as more earth dams have failed because of inadequate spillways than for any other one cause, the study and determination of the maximum flood flows to be provided for is of vital importance. With the passage of time more and more data in regard to flood flows become available for study, and engineers are becoming convinced that much greater provision for spillway discharge should be made in the future than in the past. This is especially true in regard to dams above communities of large and increasing population and wealth. The Commission believes that in attempting to solve such a problem where the wrong answer might result in disaster, it should consult with and have the advice of some of the ablest engineers in the country. The Commission, with these thoughts in mind, unanimously adopted a resolution directing the Secretary to have an item prepared for insertion in the General Appropriation Bill at the session of the General Assembly of 1923, for the purpose of securing the services of eminent engineers, to the end that a joint report might be prepared recommending standards to be used for spillways in dams in various sized drainage areas.

OTHER ENCROACHMENTS

From January 1st, 1921, to May 31st, 1922, the total number of permits for encroachments other than dams was 330, as compared with 212 in 1920, and 254 in 1919. Of these permits, 259 were for bridges, 8 for fills and 63 for miscellaneous encroachments, such as walls, channel changes, ice breakers, etc. Thirty-four complaints in regard to encroachments were investigated and conditions corrected or remedial measures suggested.

STREAM GAGING, FLOOD WARNING AND PRECIPITATION, (Oct. 1, 1920—Sept. 30, 1921)

There were 86 stream gaging stations in operation at the beginning of the water year, October 1, 1920; 4 new stations were established during the year, making a total of 90 stations on September 30, 1921.

The Flood Warning service was continued in the Susquehanna Basin, although there were only two floods of sufficient magnitude to require publication of warnings.

The precipitation stations were maintained as usual and the records were submitted to the United States Weather Bureau for publication in its monthly and annual bulletins.

During the first nine months of the year, the hydrographic work was carried on in cooperation with the United States Geological Survey. Under this cooperative arrangement, the Government expended a small amount of money in Pennsylvania and assigned a District Engineer who was in charge of the Hydrographic Division. The cooperation was discontinued on June 30, 1921.

PYMATUNING RESERVOIR PROJECT

Purchase of land in Pennsylvania for the Pymatuning Reservoir Project was begun in 1921. Appraisal had been made during 1920, by a Commission made up of the following:

W. A. McMasters—Chairman
President—Jamestown Banking Company, Jamestown.

Daniel L. Bunnel,
President—Linesville State Bank, Linesville.

Harry McDowell,
Vice-President—McDowell National Bank, Sharon.

John E. Reynolds,
President—Merchants' National Bank, Meadville.

Geo. S. Beal,
Division Engineer—Water Supply Commission of Penn'a., Harrisburg.

This Commission made examinations of various parcels of land in the reservoir area, classified the land into groups, placed a valuation on each class of land for each farm, including timber and buildings, and submitted a report in December 1920. This appraisal was supplemented by a report from Arthur E. Morgan, of the Dayton-Morgan Engineering Company and Chief Engineer of the Miami Conservancy District, under whose direction 70,000 tracts of land valued at seven or eight million dollars were purchased for flood regulation purposes, at and near Dayton, Ohio. The land was examined by J. Edward Sauer, President of the American National Bank, Dayton, Ohio, and who had direct charge of the purchase of land for the Miami Conservancy District. Mr. Sauer viewed 191 of the 260 parcels of land to be acquired in Pennsylvania, interviewed members of the Appraisal Commission and others, and carefully reviewed the appraisal figures. His report to the Dayton-Morgan Engineering Company was submitted on February 3, 1921, and it was transmitted to the Commission with a report from Mr. Morgan on February 4, 1921.

The report confirmed the values arrived at in the report of the Appraisal Commission with a few minor exceptions. Mr. Morgan later spent two days visiting almost every part of the reservoir site and submitted a report on June 13, in which he stated: "That the reservoir location is unquestionably well suited for its purpose and the dam site is a reasonably good one."

He also reported that he saw no necessity for further appraisal and was satisfied with the way in which the State's interests were being handled.

Neither Mr. Morgan nor Mr. Sauer reported upon the timber value in the reservoir area, this valuation having been made several years before, and brought up to date in February 1921, by the Department of Forestry.

The land acquired during 1921 and to May 31, 1922, amounted to 5,083.6 acres, appraised at $273,035, and purchased for $266,450. This amount includes the value of improvements and timber. It was purchased under the direction of George E. Etter of Harrisburg, acting Real Estate Expert for the Commission. The titles were examined and insured by the Potter Title & Trust Company of Pittsburgh.

FRENCH CREEK IMPROVEMENT

During the year 1921 several engineering studies, plans and preliminary estimates were made in connection with various schemes for the amelioration of flood conditions in the French Creek Valley in and above Meadville, Crawford County; Acts of the General Assembly approved July 25th, 1917, and July 18th, 1919, having authorized the Commission to undertake this work. In May 1922 a field location and property survey was made for a cut-off channel below the Buchanan Bridge, and the necessary data secured for an accurate estimate of cost of the proposed work.

LACKAWAXEN DIKE

An Act approved the 27th day of May 1921, made an appropriation of $5,000 to the Water Supply Commission of Pennsylvania for the purpose of building and constructing a retaining wall or dike along the Delaware River at Lackawaxen, Pike County, and, in September 1921, a field investigation and survey was made for the purpose of preparing plans and specifications for the construction of such a wall or dike. It was decided to protect the river bank by paving the slope instead of by building a retaining wall or dike, as the slope paving would not only be better but much cheaper. An estimate made by the Commission's Engineers showed that it would cost approximately $15,000 to provide the bank protection contemplated by the Act, by the slope paving method.

NATIONAL FOREST PURCHASE AREA

Under provisions of the Act of May 11th, 1911, as amended by the Act of April 21st, 1921, the Water Supply Commission, on September 22nd, 1921, approved a minimum unit, known as the Allegheny Purchase Unit, of 412,000 acres in Warren, Forest, McKean and Elk counties, within which purchases might be made by the United States Government for National Forest Purposes.

The above "minimum purchase area" was approved under date of August 10, 1921, by the State Forest Commission. During its consideration of this matter, the Water Supply Commission had before it a report by District Foresters Rowland and Port, of the Department of Forestry, recommending approval by the State Forest Commission of this "minimum purchase area."

COOPERATIVE STUDIES OF FLOOD CONTROL

An Act of Assembly approved the 25th day of July, 1917, appropriated the sum of $15,000.00 to the Water Supply Commission for the purpose of cooperating with the Government of the United States in making examinations, investigations and surveys, and in preparing plans and estimates of costs for controlling the flood waters of rivers of this Commonwealth.

An Act approved July 18th, 1919, reappropriated the $15,000.00 appropriated July 25th, 1917, and carried an additional appropriation of $10,000.00 for cooperative flood water control investigations and studies with the Federal Government. Subsequent to the approval of the Act of July 25th, 1917, the Water Supply Commission communicated with the Secretary of War, Washington, D. C., relative to the procedure necessary to be undertaken by the Commission to carry into effect the provisions of the above Act. In reply, the Assistant Secretary of War advised that there were no Federal funds available for such work, that investigations of this character have been made generally under special authorizations in river and harbor acts, and that investigations of this character authorized in the State of Pennsylvania had been completed and reports made to Congress.

CHAPTER II

STREAM GAGING, FLOOD WARNING AND PRECIPITATION.

STREAM GAGING

At the beginning of the year 86 stream gaging stations were being maintained; 4 new stations were established during the year, making a total of 90 in operation at the end of the year. Of these 11 were maintained for gage height records only and it is not expected that the daily mean gage height will be translated into discharge. At 12 other stations there has not been a sufficient number of discharge measurements made to determine daily discharge. For these stations the daily mean gage height and discharge measurements are published. The same data are published for the remaining stations together with tables of daily and monthly discharge. All these data will be found in detail in the appendix to this report.

The outstanding features of the 1921 records are the low flows in the fall and early summer; short ice periods and the low maximum stages.

In October, when the ground water supply is usually replenished and the stream flow increased, the rainfall was nearly two inches below normal and the stream flow was unusually low for that month.

During the month of June, in the midst of the growing period, there was a deficiency of nearly one and a quarter inches of rainfall and the streams receded to unusually low stages for that time of the year.

The temperatures during the winter months were unusually high and the ice periods were of short duration. The snowfalls were light and the amount of snow accumulated on the drainage areas was too small to produce the usual high stages of early spring when it was melted.

The relatively low maximum stages for the year as compared with maximum stages which have occurred are shown in the following table.

TABLE NO. II

Maximum Stages reached during the year ending September 30, 1921, and Highest Stages recorded

Location	Stream	Maximum stage during the year ending September 30, 1921	Maximum stage record
Riegelsville	Delaware River	21.0	41.5 October 1903
Bethlehem	Lehigh River	7.3	25.9 February 1902
Reading	Schuylkill River	6.6	23.0 September 1850
Wilkesbarre	North Branch Susquehanna River	19.0	33.1 March 1865
Williamsport	West Branch Susquehanna River	11.8	33.5 June 1889
Newport	Juniata River	16.0	35.9 June 1889
Harrisburg	Susquehanna River	11.8	26.8 June 1889
Kittanning	Allegheny River	15.2	30.4 March 1913
Avonmore	Kiskiminitas River	15.6	33.8 March 1907
Lock No. 4	Monongahela River	27.0	45.2 July 1888
Connellsville	Youghiogheny River	10.1	18.4 March 1907

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The yearly mean discharge in the Ohio Basin, as represented by the Allegheny River at Kittanning, was 20 per cent less than the mean for the twelve years ending September 30, 1921; 3 per cent in excess of that for 1915, which was the minimum year during the period, and 37 per cent less than that of 1912, which was the maximum year in the period considered.

In the Susquehanna Basin, as represented by the Susquehanna River at Harrisburg, the yearly mean discharge was 10 per cent less than the mean for the twelve years; 20 per cent in excess of that for 1911, which was the minimum year during the period, and 31 per cent less than in 1916, which was the maximum year.

In the Delaware Basin, as represented by the Lehigh River at Bethlehem, the yearly mean discharge was 10 per cent more than the mean for the twelve years ending September 30, 1921; 46 per cent in excess of that for 1911, which was the minimum year during the period, and 6 per cent less than in 1920, which was the maximum year during the period considered.

FLOOD WARNING

The year 1921 was characterized by unusually low stages during floods. The mean temperatures for the months of December, January, February and March were from three to eleven degrees above normal. The snowfall was light, the streams were frozen for short periods and the ice covers did not attain much thickness.

In the early part of March a comparatively small amount of rainfall, accompanied by a relatively high temperature, melted the remaining snow in the upper reaches of the Susquehanna River and produced the highest stages for the year on the North and West branches.

The North Branch Susquehanna River rose about fourteen (14) feet at Wilkes-Barre; the West Branch had an increase of about eight (8) feet at Williamsport and the main Susquehanna River rose about seven (7) feet at Harrisburg. The Juniata River was not materially affected.

The following table shows the estimated stages and those which actually occurred:

TABLE NO. III

Predicted and Actual Stages reached March 7-11, 1921

Location	Stream	Predicted Stage	Actual Stage
Binghamton	North Branch Susquehanna River	11.0	12.0
Corning	Chemung River	10.0	9.4
Towanda	North Branch Susquehanna River	12.5	12.2
Wilkes-Barre	North Branch Susquehanna River	19.0	19.0
Danville	North Branch Susquehanna River	15.0	15.5
Bower	West Branch Susquehanna River	9.0	8.9
Clearfield	West Branch Susquehanna River	5.0	4.2
Renovo	West Branch Susquehanna River	8.5	8.0
Lock Haven	West Branch Susquehanna River	5.0	4.0
Jersey Shore	West Branch Susquehanna River	13.0	11.8
Williamsport	West Branch Susquehanna River	12.0	11.8
Lewisburg	West Branch Susquehanna River	10.0	10.5
Harrisburg	Susquehanna River	11.5	11.8

During the early part of May a rainfall of about two and a half inches over the upper reaches of the Juniata River caused the highest stages along that stream for the year.

There was a rise of about six (6) feet at Huntingdon and ten (10) feet at Newport, which resulted in a rise of three (3) feet on the main Susquehanna River at Harrisburg.

The following table shows the estimated stages and those which actually occurred:

TABLE NO. IV

Predicted and Actual Stages reached May 5-6, 1921

Location	Stream	Predicted Stage	Actual Stage
Huntingdon	Frankstown Branch Juniata River	10.0	9.6
Saxton	Raystown Branch Juniata River	9.0	8.2
Newport	Juniata River	17.0	16.0
Harrisburg	Susquehanna River	10.0	9.8

PRECIPITATION

The Water Supply Commission maintains twelve (12) precipitation stations at which it has installed the equipment and employs the observer; at fifteen (15) other stations the equipment is supplied by the Water Supply Commission but the records are kept by cooperating parties at no expense to the State.

The United States Weather Bureau maintains a much larger number of stations in Pennsylvania and publishes its records monthly and annually. As it would be more convenient to parties using precipitation records to find them all under one cover, a cooperative arrangement was made with the United States Weather Bureau whereby the Water Supply Commission has furnished its data to the Weather Bureau for publication in its monthly and annual bulletins.

Prior to 1920 the Water Supply Commission published their records in the annual reports; for subsequent years they have been published by the Unitd States Weather Bureau.

The following table shows the precipitation stations in Pennsylvania:

TABLE NO. V

PRECIPITATION STATIONS IN PENNSYLVANIA

ATLANTIC DRAINAGE

Station	Drainage Basin
Allentown	Lehigh
Altoona	Juniata
Ansonia	West Branch Susquehanna
Arendtsville	Potomac

Bellefonte	West Branch Susquehanna
Bethlehem	Lehigh
Bloserville	Susquehanna
Bustleton	Delaware
Carlisle	Susquehanna
Catawissa	North Branch Susquehanna
Center Hall	Susquehanna
Chambersburg	Potomac
Clearfield	West Branch Susquehanna
Coatesville	Delaware
Colebrook	Susquehanna
Cresson	Juniata
Doylestown	Delaware
Driftwood	West Branch Susquehanna
Emporium	West Branch Susquehanna
Ephrata	Susquehanna
Everett	Juniata
Forest City	North Branch Susquehanna
Freeland	Lehigh
George School	Delaware
Gettysburg	Potomac
Girardville	Schuylkill
Gordon	Susquehanna
Gouldsboro	Lehigh
Graters Ford	Schuylkill
Hamburg	Schuylkill
Hanover	Susquehanna
Harrisburg	Susquehanna
Hawley	Delaware
Holtwood	Susquehanna
Huntingdon	Juniata
Jersey Shore	West Branch Susquehanna
Lancaster	Susquehanna
Lansford	Lehigh
Lawrenceville	North Branch Susquehanna
Lebanon	Susquehanna
Lewisburg	West Branch Susquehanna
Lloyd	West Branch Susquehanna
Lock Haven	West Branch Susquehanna
Marcus Hook	Delaware
Mauch Chunk	Lehigh
Mifflintown	Juniata
Milford	Delaware
Montrose	North Branch Susquehanna
Mount Pocono	Delaware
Mount Union	Juniata
Muncy Valley	West Branch Susquehanna
Narberth	Delaware
Neshaminy	Delaware
Palmerton	Lehigh
Philadelphia (a)	Delaware
Philadelphia (d)	Delaware

Phoenixville	Schuylkill
Pottstown	Schuylkill
Pottsville	Schuylkill
Quakertown	Delaware
Reading	Schuylkill
Renovo	West Branch Susquehanna
Sadsburyville	Delaware
Scranton	North Branch Susquehanna
Selinsgrove	Susquehanna
Shawmont	Schuylkill
State College	West Branch Susquehanna
Stroudsburg	Delaware
Sunbury	Susquehanna
Towanda	North Branch Susquehanna
Trout Run	West Branch Susquehanna
Weikert	Susquehanna
Wellsboro	West Branch Susquehanna
West Chester	Delaware
White Haven	Lehigh
Wilkes-Barre	North Branch Susquehanna
Williamsport	West Branch Susquehanna
York	Susquehanna
York Haven	Susquehanna
Port Jervis, N. Y.	Delaware
Trenton, N. J.	Delaware

OHIO DRAINAGE

Beaver Dam	Ohio
Beaver Falls	Beaver
Bradford	Allegheny
Bradys Bend	Allegheny
Brookville	Allegheny
Clarion	Allegheny
Claysville	Ohio
Cloe	Allegheny
Clymer	Conemaugh
Confluence	Youghiogheny
Coraopolis	Ohio
Corry	Allegheny
Creekside	Allegheny
Davis Island Dam	Ohio
Derry	Conemaugh
Ebensburg	Conemaugh
Edinboro	Allegheny
Elk Lick	Youghiogheny
Falls Creek	Allegheny
Franklin	Allegheny
Freeport	Allegheny
Greensboro	Monongahela
Greensburg	Youghiogheny
Greenville	Beaver
Grove City	Beaver

Herrs Island Dam	Ohio
Indiana	Conemaugh
Irwin	Youghiogheny
Johnstown	Conemaugh
Ketner	Allegheny
Linesville	Beaver
Lock No. 4	Monongahela
Lycippus	Conemaugh
New Castle	Beaver
Newell	Monongahela
North Shenango	Beaver
Parkers Landing	Allegheny
Pennline	Beaver
Pittsburgh	Ohio
Ridgway	Allegheny
Saltsburg	Conemaugh
Sharon	Beaver
Somerset	Youghiogheny
Springdale	Allegheny
Summit	Beaver
Tionesta	Allegheny
Turnersville	Beaver
Uniontown	Monongahela
Vandergrift	Kiskiminitas
Warren	Allegheny
Washington	Ohio
Waynesburg	Monongahela
Westford	Beaver
West Newton	Youghiogheny

LAKE DRAINAGE

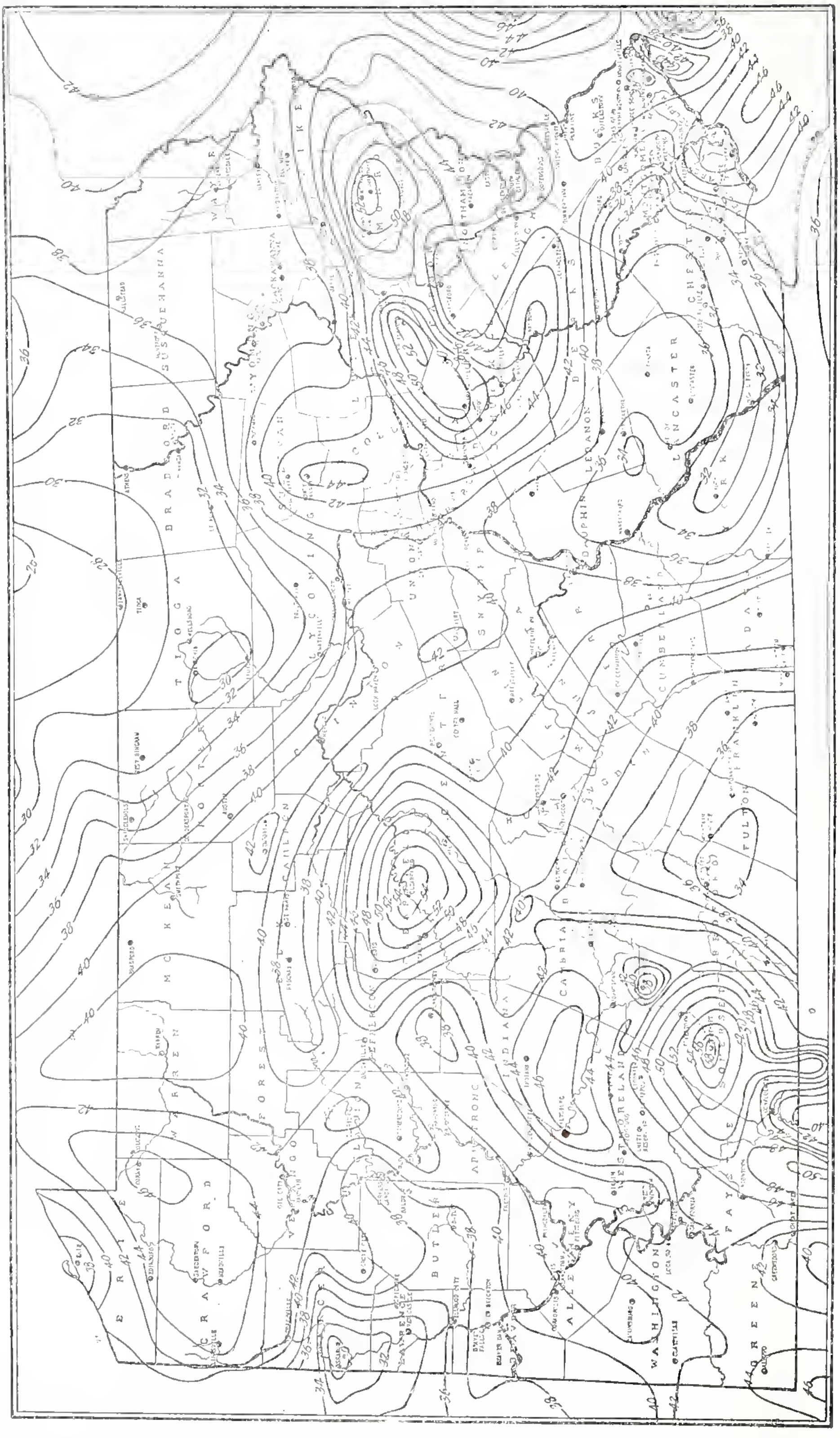
Erie	Lake Erie
West Bingham	Genesee

The mean precipitation for the year ending September 30, 1921, as computed from records of the United States Weather Bureau and Water Supply Commission, was 39.80 inches, or 1.90 inches below the normal.

Eight months of the year were deficient in precipitation. In October, when the replenishing period usually begins, the rainfall was 1.79 inches below the normal for that month and in June, during the growing season, there was a deficiency of 1.18 inches. During the month of November the precipitation was 1.01 inches above the normal for that month and in September there was an excess of 1.35 inches, which compensated to a large extent the deficiency of other months.

The map on page 22 showing two inch isohyetals for the year ending September 30, 1921, was drawn from all precipitation known to be observed in Pennsylvania, including that of private interests not published by the United States Weather Bureau. For drainage areas in adjacent states, tributary to Pennsylvania streams, the Weather Bureau records were used.

The yearly precipitation, over drainage areas tributary to gaging stations, used in calculating the per cent run-off to precipitation, was computed from the following map.



MAP SHOWING PRECIPITATION FOR THE YEAR ENDING September 30, 1921.

MAP SHOWING PRECIPITATION FOR THE YEAR ENDING SEPTEMBER 30, 1921.

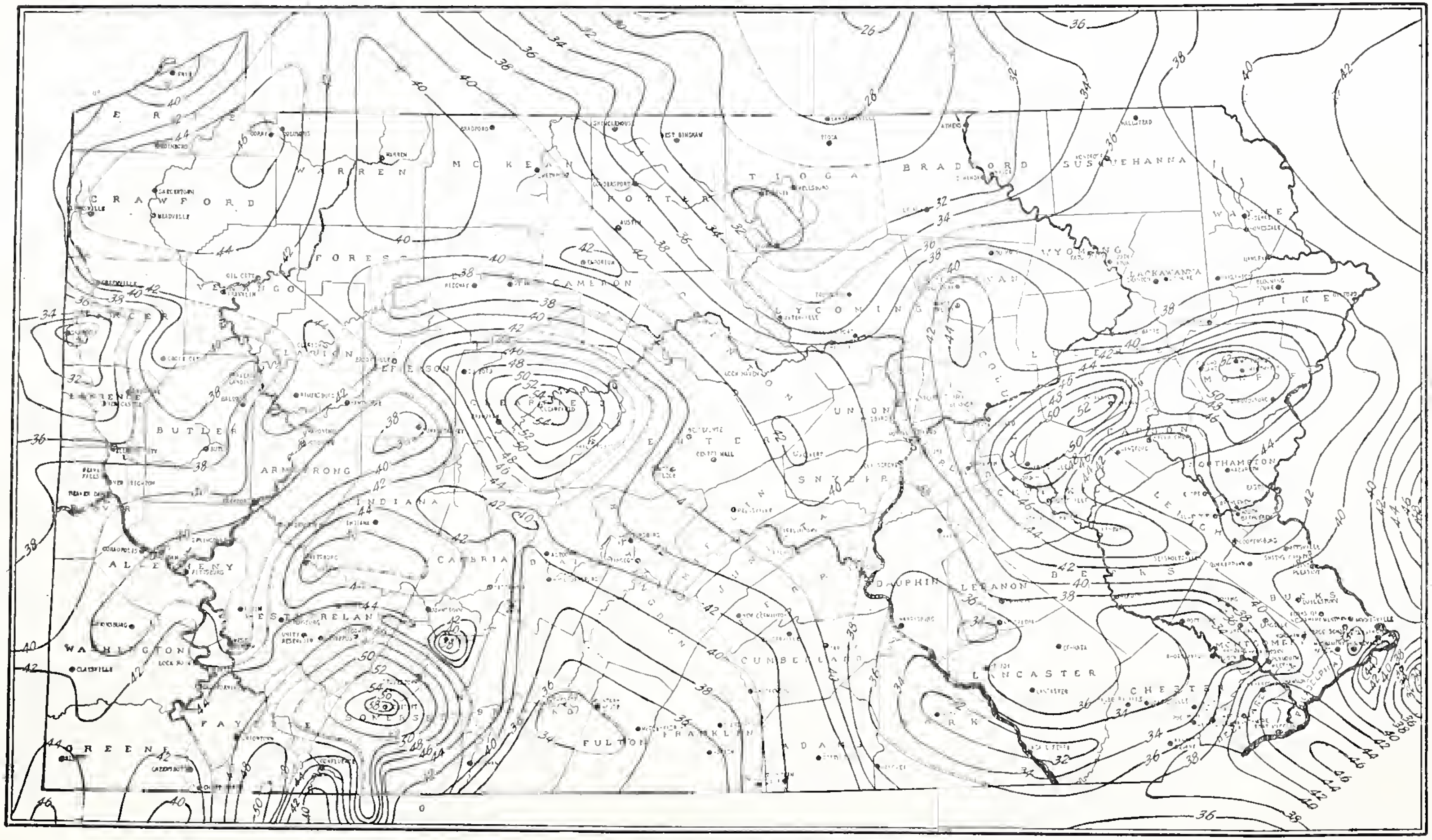


Plate I

APPENDIX

HYDROGRAPHIC DATA
FOR THE YEAR ENDING SEPTEMBER 30, 1921.

DEFINITION OF TERMS

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second feet, gallons per minute, and discharge in second feet per square mile, and (2) those that represent the actual quantity of water, as run-off in depth of inches, and millions of cubic feet. The principal terms used in this series of reports are second feet, second feet per square mile, and run-off in inches. They may be defined as follows:

"Second feet" is an abbreviation for "cubic feet per second." A second foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the tables of convenient equivalents, page 26.

"Second feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off (depth in inches)" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth of inches.

The following terms not in common use are here defined:

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

"Control," a term used to designate the section or sections of the stream below the gage which determine the stage-discharge relation at the gage. It should be noted that the control may not be the same at all stages.

The "point of zero flow" for a gaging station is that point on the gage—the gage height—to which the surface of the river falls when the discharge is reduced to zero.

CONVENIENT EQUIVALENTS

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in inches over the area

Discharge (second feet per square mile)	Run-off (depth in inches)				
	1 day	28 days	29 days	30 days	31 days
1	0.03719	1.041	1.079	1.116	1.153
2	.07438	2.083	2.157	2.231	2.306
3	.11157	3.124	3.236	3.347	3.459
4	.14876	4.165	4.314	4.463	4.612
5	.18595	5.207	5.393	5.578	5.764
6	.22314	6.248	6.471	6.694	6.917
7	.26033	7.289	7.550	7.810	8.070
8	.29752	8.331	8.628	8.926	9.223
9	.33471	9.372	9.707	10.041	10.376

NOTE—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting discharge in second-feet into run-off in millions of cubic feet

Discharge (second-feet)	Run-off (millions of cubic feet)				
	1 day	28 days	29 days	30 days	31 days
1	0.0864	2.419	2.506	2.592	2.678
2	.1728	4.838	5.012	4.184	5.356
3	.2592	7.257	7.518	7.776	8.034
4	.3456	9.676	10.02	10.37	10.71
5	.4320	12.10	12.53	12.96	13.39
6	.5184	14.51	15.04	15.55	16.07
7	.6048	16.93	17.54	18.14	18.75
8	.6912	19.35	20.05	20.74	21.42
9	.7776	21.77	22.55	23.33	24.10

NOTE—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting discharge in second-feet into run-off in millions of gallons

Discharge (second-feet)	Run-off (millions of gallons)				
	1 day	28 days	29 days	30 days	31 days
1	0.6463	18.10	18.74	19.39	20.04
2	1.293	36.20	37.48	38.78	40.08
3	1.939	54.30	66.22	58.17	60.12
4	2.585	72.40	74.96	77.56	80.16
5	3.232	90.50	93.70	96.95	100.2
6	3.878	108.6	112.4	116.3	120.2
7	4.524	126.7	131.2	135.7	140.3
8	5.171	144.8	149.9	155.1	160.3
9	5.817	162.9	168.7	174.5	180.4

NOTE—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting velocity in feet per second into velocity in miles per hour

(1foot per second = 0.681818 mile per hour, or very nearly two-thirds mile per hour; 1 mile per hour = 1.4666 feet per second. In computing the table the values 0.68182 and 1.4667 were used)

Feet per second (units)	Miles per hour for tenths of foot per second									
	0	1	2	3	4	5	6	7	8	9
0	0.000	0.068	0.136	0.205	0.273	0.341	0.409	0.477	0.545	0.614
1	.682	.750	.818	.886	.995	1.02	1.09	1.16	1.23	1.30
2	1.36	1.43	1.50	1.57	1.64	1.70	1.77	1.84	1.91	1. 8
3	2.05	2.11	2.18	2.25	2.32	2.39	2.45	2.52	2.59	2.66
4	2.73	2.80	2.86	2.93	3.00	3.07	3.14	3.20	3.27	3.34
5	3.41	3.48	3.55	3.61	3.68	3.75	3.82	3.89	3.95	4.02
6	4.09	4.16	4.23	4.30	4.36	4.43	4.50	4.57	4.64	4.70
7	4.77	4.84	4.91	4.98	5.05	5.11	5.18	5.25	5.32	5.39
8	5.45	5.52	5.59	5.66	5.73	5.80	5.86	5.93	6.00	6.07
9	6.14	6.20	6.27	6.34	6.41	6.48	6.55	6.61	6.68	6.75

1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.

1 second-foot for one year (365 days) covers 1 square mile 1.131 feet or 13.572 inches deep.
1 second-foot for one year (365 days) equals 31,536,000 cubic feet.
1 second-foot for one day equals 86,400 cubic feet.
1,000,000,000 (1 United States Billion) cubic feet equals 11,570 second-feet for one day.
1,000,000,000 cubic feet equals 414 second feet for one 28-day month.
1,000,000,000 cubic feet equals 399 second feet for one 29-day month.
1,000,000,000 cubic feet equals 386 second feet for one 30-day month.
1,000,000,000 cubic feet equals 373 second feet for one 31 day month.
100 United States gallons per minute equals 0.223 second-foot.
1,000,000 United States gallons per day equals 1.55 second-feet.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals 5,280 feet.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.
1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76.0 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.
1⅓ horsepower equals about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Sec. ft.} \times \text{fall in feet}}{11}$ = net horse power on water wheel realizing 80 per cent. of theoretical power.

EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1920, and ending September 30, 1921. At the first of January in most parts of the United States much of the precipitation in the preceding three months is stored as ground water, in the form of snow or ice or in ponds, lakes, and swamps, and this stored water passes off in the streams during the spring break-up; at the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for a year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct reading on a chain or staff gage. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge.

From the discharge measurements rating tables are prepared that give the discharge for any stage. The application of the daily gage heights to these rating tables give the daily discharge from which the monthly and yearly mean discharge are computed.

The data presented for each gaging station comprises a description of the station, a table giving results of discharge measurements, a table showing daily gage height, a table showing the daily discharge, and a table of monthly and yearly discharge and run-off.

Where the base data are insufficient to determine the daily discharge, tables giving daily gage heights and results of discharge measurements are published.

The description of the station gives, in addition to statements regarding location and equipment, information in regard to any conditions that may affect the permanence of the stage-discharge relation, covering such subjects as the occurrence of ice, shifting of control, and the cause and effect of backwater. It gives also information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records.

The table of daily discharge gives the discharge in second-feet corresponding to the mean of the gage heights read each day. At stations on streams subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage heights may not be the true mean discharge for the day.

In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gage height was highest. As the gage height is the mean for the day it does not indicate correctly the stage when the water surface was at crest height, and the corresponding discharge was consequently larger than that given in the maximum column. Likewise, in the column headed "Minimum," the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet per second during the month. On this average flow computations recorded in the remaining columns are based.

ACCURACY OF FIELD DATA AND COMPUTED RECORDS

The accuracy of stream-flow data depends primarily (1) on the permanence of the stage-discharge relation and (2) on the accuracy of observation of stage, measurement of flow, and interpretation of records.

A paragraph in the description of the station gives information regarding the (1) permanence of the stage-discharge relation,

(2) precision with which the discharge rating curve is defined, (3) refinement of gage readings, (4) frequency of gage readings, and (5) methods of applying daily gage height to the rating table to obtain the daily discharge.

For the rating tables "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and depth of run-off in inches may be subject to some error caused by the inclusion of non-contributing districts in the measured drainage area, or by inability to interpret the effect of artificial regulation of the flow of the river above the station.

The table of monthly discharge gives only a general idea of the flow at the station and should not be used for other than preliminary estimates; the tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

The Commonwealth of Pennsylvania is divided into three main drainage basins; the Delaware, Susquehanna and Ohio. The hydrographic data in the following pages are divided into three groups, corresponding to these three basins. The stations in each basin are shown in the following tables and their location is indicated on the map (Plate 1) with reference number corresponding to those given in the tables.

TABLE NO. VI

*Gaging Stations in Delaware Basin**

Station No.	Stream	Location
1	Lackawaxen River	West Hawley
2	Wallenpaupack Creek	Wilsonville
3	Shohola Creek	Shohola
4	Delaware River	Port Jervis, N. Y.
5	Bushkill Creek	Shoemakers
6	McMichaels Creek	Stroudsburg
7	Lehigh River	Tannery
8	Little Lehigh Creek	Allentown
9	Lehigh River	Bethlehem
10	Delaware River	Riegelsville
11	Little Schuylkill River	Tamaqua
12	Schuylkill River	Reading
13	Perkiomen Creek	Graters Ford
14	Brandywine Creek	Chadds Ford

*For information available on each station, see description of station.

TABLE NO. VII

*Gaging Stations in Susquehanna Basin**

Station No.	Stream	Location
1	North Branch Susquehanna River	Binghamton, N. Y.
2	North Branch Susquehanna River	Vestal, N. Y.
3	Chemung River	Corning, N. Y.
4	North Branch Susquehanna River	Towanda
5	Towanda Creek	Monroeton
6	Tunkhannock Creek	Dixon
7	Lackawanna River	Moosic
8	North Branch Susquehanna River	Wilkes-Barre
9	Wapwallopen Creek	Wapwallopen
10	Nescopeck Creek	St. Johns
11	Fishing Creek	Bloomsburg
12	North Branch Susquehanna River	Danville
13	West Branch Susquehanna River	Bower
14	West Branch Susquehanna River	Clearfield
15	Clearfield Creek	Dimeling
16	Driftwood Branch Sinnemahoning Creek	Sterling Run
17	Driftwood Branch Sinnemahoning Creek	Driftwood
18	West Branch Susquehanna River	Renovo
19	West Branch Susquehanna River	Lock Haven
20	Bald Eagle Creek	Milesburg
21	Bald Eagle Creek	Beech Creek Station
22	Pine Creek	Cedar Run
23	West Branch Susquehanna River	Jersey Shore
24	Lycoming Creek	Trout Run
25	West Branch Susquehanna River	Williamsport
26	West Branch Susquehanna River	Lewisburg
27	Susquehanna River	Sunbury
28	Frankstown Branch Juniata River	Williamsburg
29	Little Juniata River	Tyrone
30	Frankstown Branch Juniata River	Huntingdon
31	Raystown Branch Juniata River	Saxton
32	Tuscarora Creek	Port Royal
33	Juniata River	Newport
34	Susquehanna River	Harrisburg
35	Little Swatara Creek	Pine Grove
36	Swatara Creek	Harpers
37	Codorus Creek	York

*For information available on each station, see description of station.

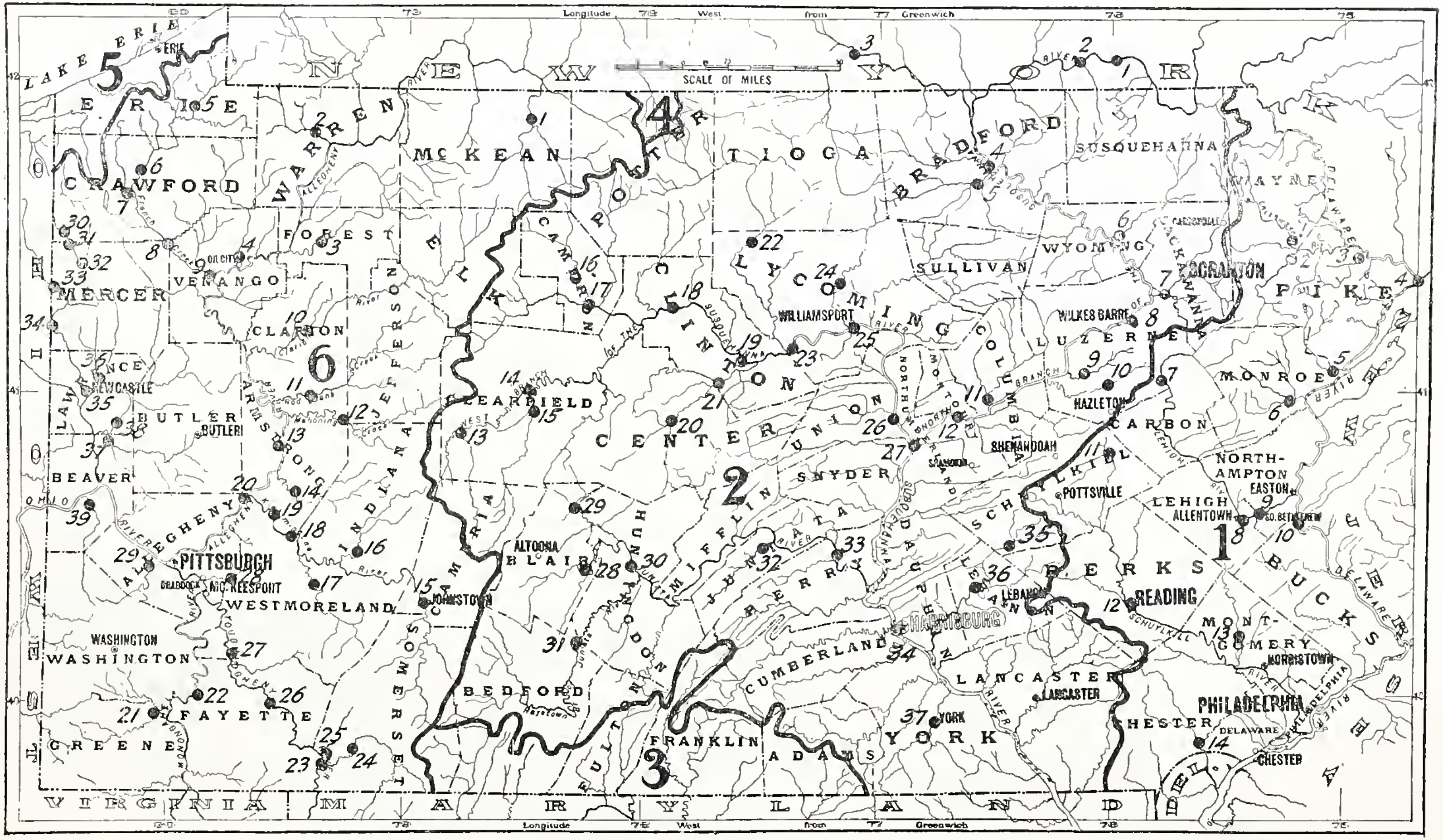
TABLE NO. VIII

*Gaging Stations in Ohio Basin**

Station No.	Stream	Location
1	Allegheny River	Larabee
2	Brokenstraw Creek	Youngsville
3	Tionesta Creek	Butler Bridge
4	Oil Creek	Rouseville
5	French Creek	Kimmeytown
6	French Creek	Saegertown
7	Cussewago Creek	Meadville
8	French Creek	Carlton
9	Allegheny River	Franklin
10	Clarion River	Clarion
11	Red Bank Creek	Saint Charles
12	Mahoning Creek	Dayton
13	Allegheny River	Kittanning
14	Crooked Creek	Hileman's Farm
15	Stony Creek	Johnstown
16	Blacklick Creek	Blacklick
17	Loyalhanna Creek	New Alexandria
18	Kiskiminitas River	Avonmore
19	Kiskiminitas River	Vandergrift
20	Allegheny River	Freeport
21	South Fork Ten Mile Creek	Pollock's Mill
22	Monongahella River	South Brownsville
23	Youghiogheny River	Confluence
24	Casselman River	Markleton
25	Laurel Hill Creek	Ursina
26	Youghiogheny River	Connellsville
27	Youghiogheny River	Sutersville
28	Turtle Creek	Trafford
29	Chartiers Creek	Carnegie
30	Shenango River	Turnerville
31	Shenango River	Jamestown
32	Little Shenango River	Greenville
33	Pymatuning Creek	Orangeville
34	Shenango River	Sharon
35	Shenango River	New Castle
36	Neshannock Creek	Eastbrook Station
37	Connoquenessing Creek	Hazen
38	Slippery Rock Creek	Wurtemburg
39	Raccoon Creek	Moffatt's Mill

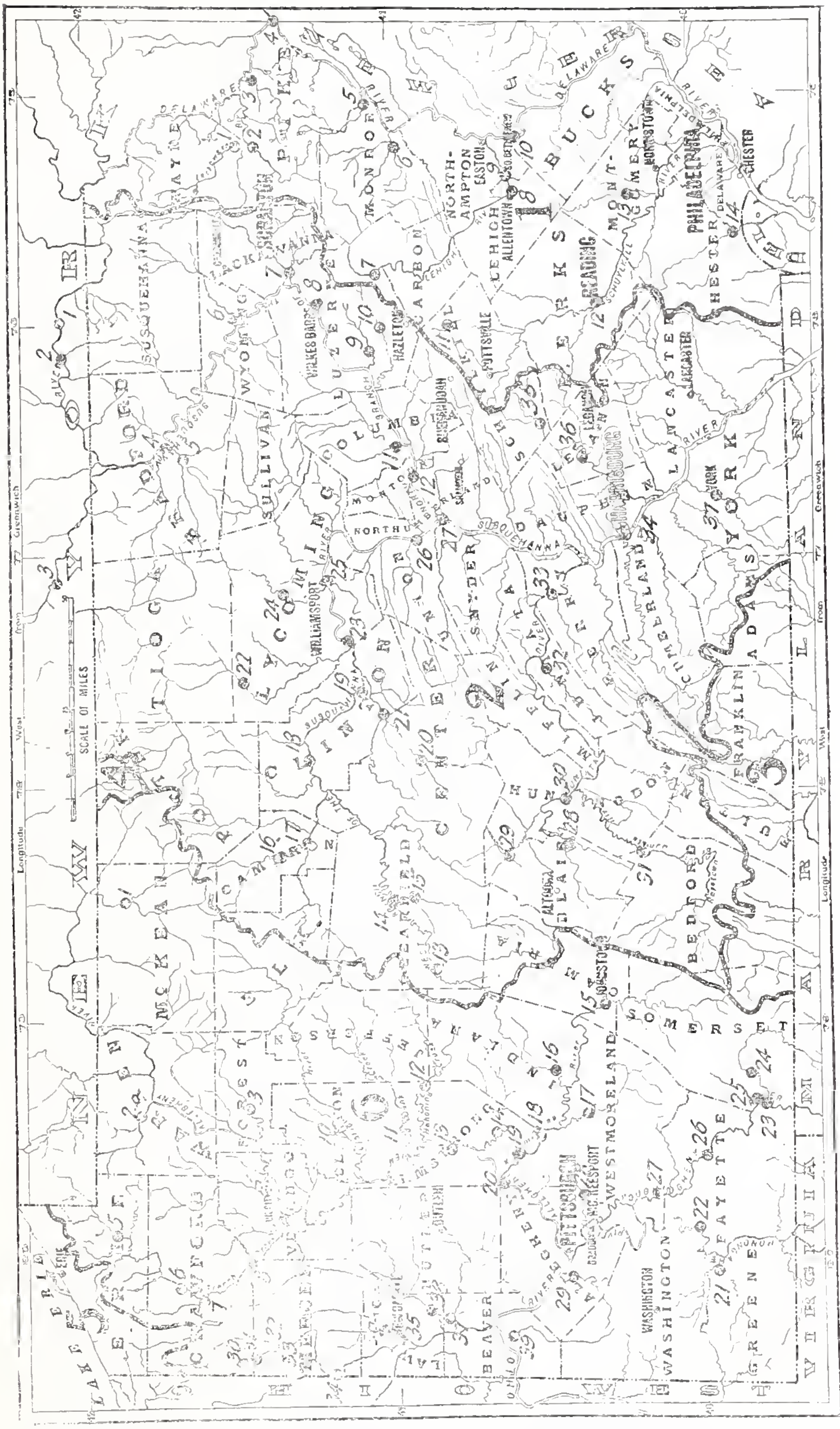
*For information available on each station, see description of station.

MAP SHOWING LOCATION OF GAGING STATIONS FOR THE YEAR ENDING SEPTEMBER 30, 1921.



Legend,—Drainage Basins—(1) Delaware, (2) Susquehanna, (3) Potomac, (4) Genesee, (5) Erie, (6) Ohio

Plate II



MAP SHOWING LOCATION OF GAGING STATIONS FOR THE YEAR ENDING, September 30, 1921.

DELAWARE BASIN

LACKAWAXEN RIVER NEAR WEST HAWLEY

Location.—At single-span steel highway bridge, known as Riverside Bridge, West Hawley, Wayne County, about one-half mile upstream from the mouth of Middle Creek.

Drainage Area.—212 square miles.

Records Available.—May 19, 1921, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to hundredths twice daily by J. S. Pennell.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Section is walled in below the bridge. Banks are of medium height and subject to overflow at extremely high stages. Bed is composed of gravel. Control is at a riffle about 50 feet below the gage where the bed is composed of coarse gravel.

Extremes of Stage.—Maximum gage height during the period, 2.28 feet observed at 4.20 p. m. September 22; minimum, 0.96 foot at 4.40 p. m. September 6.

Ice.—Stage-discharge relation usually affected by ice.

Discharge Measurements of Lackawaxen River near West Hawley, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
1	May 19	H. J. McIntyre	1.70	178
2	June 29*	J. M. Snavely	1.16	62.1
3	Sept. 15	J. M. Snavely	1.15	53.3

* Measurement made by wading 25 feet above gage.

Daily Mean Gage Height, in feet, of Lackawaxen River near West Hawley, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	-------	-------	-------	-------	-------	-------	-------	1.54	1.15	1.40	1.22
2	-------	-------	-------	-------	-------	-------	-------	-------	1.47	1.32	1.23	1.12
3	-------	-------	-------	-------	-------	-------	-------	-------	1.26	1.30	1.36	1.06
4	-------	-------	-------	-------	-------	-------	-------	-------	1.31	1.22	1.42	1.08
5	-------	-------	-------	-------	-------	-------	-------	-------	1.32	1.18	1.35	1.02
6	-------	-------	-------	-------	-------	-------	-------	-------	1.34	1.16	1.21	.97
7	-------	-------	-------	-------	-------	-------	-------	-------	1.36	1.12	1.32	1.20
8	-------	-------	-------	-------	-------	-------	-------	-------	1.36	1.11	1.66	1.28
9	-------	-------	-------	-------	-------	-------	-------	-------	1.33	1.11	1.44	1.19
10	-------	-------	-------	-------	-------	-------	-------	-------	1.28	1.18	1.36	1.05
11	-------	-------	-------	-------	-------	-------	-------	-------	1.16	1.38	1.29	1.00
12	-------	-------	-------	-------	-------	-------	-------	-------	1.20	1.29	1.29	1.27
13	-------	-------	-------	-------	-------	-------	-------	-------	1.24	1.27	1.45	1.16
14	-------	-------	-------	-------	-------	-------	-------	-------	1.35	1.16	1.30	1.19
15	-------	-------	-------	-------	-------	-------	-------	-------	1.28	1.55	1.33	1.09
16	-------	-------	-------	-------	-------	-------	-------	-------	1.18	1.62	1.31	1.09
17	-------	-------	-------	-------	-------	-------	-------	-------	1.37	1.40	1.30	1.04
18	-------	-------	-------	-------	-------	-------	-------	-------	1.38	1.40	1.16	1.00
19	-------	-------	-------	-------	-------	-------	-------	1.70	1.10	1.24	1.23	1.10
20	-------	-------	-------	-------	-------	-------	-------	1.61	1.21	1.60	1.28	1.13
21	-------	-------	-------	-------	-------	-------	-------	1.62	1.26	1.57	1.10	1.09
22	-------	-------	-------	-------	-------	-------	-------	1.62	1.09	1.40	1.07	1.95
23	-------	-------	-------	-------	-------	-------	-------	1.58	1.13	1.30	1.14	1.40
24	-------	-------	-------	-------	-------	-------	-------	1.56	1.17	1.28	1.20	1.46
25	-------	-------	-------	-------	-------	-------	-------	1.62	1.07	1.27	1.09	1.32
26	-------	-------	-------	-------	-------	-------	-------	1.82	1.10	1.23	1.22	1.30
27	-------	-------	-------	-------	-------	-------	-------	1.61	1.10	1.20	1.08	1.29
28	-------	-------	-------	-------	-------	-------	-------	1.49	1.19	1.27	1.02	1.29
29	-------	-------	-------	-------	-------	-------	-------	1.50	1.20	1.49	1.07	1.38
30	-------	-------	-------	-------	-------	-------	-------	1.69	1.23	1.36	1.18	1.15
31	-------	-------	-------	-------	-------	-------	-------	1.60	-------	1.34	1.11	-------

DELAWARE BASIN—STATION NO. 2

WALLENPAUPACK CREEK AT WILSONVILLE

Location.—At two-span steel highway bridge, about one and a half miles south of Hawley, at Wilsonville, Wayne County.

Drainage Area.—227 square miles.

Records Available.—July 3, 1908, to September 30, 1921.

Gages.—Vertical staff attached to downstream end of pier and a Barrett and Lawrence water-stage recorder installed on top downstream end of pier. Zero elevation of gages, 1,146.78 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank overflows at exteremly high stages; left is high and not subject to overflow. Bed is composed of rock. Control is a log weir about 70 feet below gage, which was damaged by ice in January and repaired in September.

Extremes of Discharge.—Maximum stage during the year, from water-stage recorder, 3.92 feet at 3 p. m. March 10 (discharge, 3,346 second-feet); the corresponding gage height would have been 3.96 feet if there had not been leakage at the control weir; minimum, normal flow of stream, from water-stage recorder, 0.61 foot at 2 p. m. September 21 (discharge, 36 second-feet); there were lower gage heights recorded during the year but they occurred before the weir was repaired and the discharge was greater than on September 21. On August 20, 21, 27, 28, September 4, 5, 17 and 18 the discharge was estimated to be 10 second-feet when flashboards were placed on the dam above the gage and a portion of the stream flow was temporarily held back.

Ice.—Stage-discharge relation not usually affected by ice.

Regulation.—Flow during low stages regulated, for the operation of silk mills, by use of flashboards on a three foot concrete dam about 35 feet above gage.

Cooperation.—Records furnished by L. B. Stillwell and H. S. Putnam, Consulting Engineers, New York City.

Discharge Measurements of Wallenpaupack Creek at Wilsonville, during the year ending September 30, 1921.

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
27	May 19	H. J. McIntyre	1.03	243
28	19	H. J. McIntyre	1.01	245
29	June 29*	J. M. Snavely	.50	120
30	Sept. 15†	J. M. Snavely	.38	49.9

* Measurement made by wading 25 feet below gage.
† Measurement made by wading 250 feet below gage.

Daily Mean Gage Height, in feet, of Wallenpaupack Creek at Wilsonville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.03	1.31	1.85	1.50	0.95	1.04	1.30	1.50	0.90	0.78	0.63	0.40
2	3.40	1.37	1.80	1.50	.95	1.28	1.34	1.47	.88	.69	.63	.40
3	3.02	1.44	2.09	1.50	.90	1.65	1.37	1.47	.88	.56	.62	.20
4	2.53	1.54	2.24	1.45	.95	2.03	1.30	1.50	.86	.52	.70	------
5	2.21	1.38	2.78	1.40	1.00	2.54	1.27	1.54	.88	.52	.76	------
6	1.94	1.29	3.42	1.35	1.10	2.66	1.20	1.55	.88	.54	.80	.20
7	1.71	1.24	3.10	1.30	1.15	2.76	1.20	1.53	.87	.54	.78	.40
8	1.52	1.22	2.74	1.25	1.00	3.43	1.18	1.47	.88	.56	.66	.42
9	1.39	1.22	2.56	1.20	.95	3.81	1.14	1.40	.84	.55	.58	.42
10	1.38	1.20	2.46	1.15	.90	3.86	1.10	1.28	.82	.56	.58	.41
11	1.34	1.19	2.24	1.00	1.00	3.50	1.10	1.28	.82	.62	.69	.41
12	1.26	1.12	2.02	1.00	1.10	3.01	1.04	1.28	.82	1.21	.64	.40
13	1.19	1.12	1.82	.98	1.25	2.62	1.00	1.28	.84	1.48	.58	.42
14	1.14	1.14	1.65	1.00	1.25	2.18	1.00	1.29	.83	1.14	.56	.42
15	1.13	1.16	1.80	1.10	1.35	2.08	1.05	1.22	.81	.88	.50	.41
16	1.10	1.18	2.45	1.25	1.40	2.00	1.09	1.12	.80	.78	.50	.40
17	1.11	1.12	2.81	1.20	1.65	1.98	1.02	1.10	.80	.76	.50	------
18	1.11	1.13	2.72	1.20	1.50	1.95	1.08	1.06	.82	.98	.50	------
19	1.10	1.69	2.57	1.25	1.35	1.90	1.16	1.02	.81	.90	.47	.68
20	1.10	1.96	2.32	1.25	1.30	1.80	1.24	1.00	.80	.76	------	.66
21	1.10	1.92	2.10	1.30	1.25	1.70	1.31	1.00	.81	.70	------	.66
22	1.10	1.77	1.96	1.40	1.25	1.60	1.31	.96	.80	1.24	.42	.72
23	1.10	1.60	1.86	1.25	1.20	1.53	1.37	1.00	.80	1.32	.40	.82
24	1.07	1.59	1.70	1.20	1.20	1.48	1.68	1.04	.82	1.04	.40	.82
25	1.04	1.90	1.65	1.20	1.10	1.51	1.90	1.02	.84	.94	.38	.78
26	1.01	2.30	1.62	1.00	1.10	1.62	1.99	1.08	.82	.82	.40	.77
27	1.00	2.37	1.60	1.00	1.20	1.56	1.98	1.06	.80	.74	------	.74
28	1.00	2.24	1.58	1.00	1.30	1.50	1.80	1.00	.80	.68	------	.74
29	1.25	2.08	1.55	1.00	------	1.40	1.68	.96	.79	.63	.45	.73
30	1.34	1.92	1.50	1.10	------	1.38	1.58	.94	.80	.60	.40	.70
31	1.38	------	1.50	1.00	------	1.32	------	.91	------	.60	.40	------

NOTE.—On Aug. 20, 21, 27, 28, Sept. 4, 5, 17 and 18 there was no water in the pool above the control weir, due to leakage and flashboards being placed on the dam above gage.

Daily discharge, in second-feet, of Wallenpaupack Creek at Wilsonville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,020	336	745	540	215	254	405	541	197	157	122	76
2	2,470	373	696	540	215	398	434	519	190	136	122	76
3	1,983	424	966	540	197	656	451	519	189	108	121	43
4	1,411	497	1,106	505	215	980	409	544	186	99	138	10
5	1,080	380	1,684	470	237	1.494	387	571	189	99	154	10
6	826	324	2,503	437	287	1,611	348	578	190	104	164	60
7	628	294	2,073	405	315	1,733	342	563	187	103	157	76
8	479	282	1,624	375	237	2,590	333	519	192	106	128	79
9	386	279	1,445	345	215	3,160	313	471	176	105	111	79
10	379	274	1,339	315	197	3,254	288	396	170	107	112	78
11	357	266	1,110	237	237	2,690	285	396	170	120	136	78
12	306	232	898	237	287	2,033	255	393	170	361	123	76
13	266	232	723	228	375	1,581	239	390	176	530	110	79
14	242	239	580	237	375	1,120	237	399	174	309	107	79
15	234	247	702	287	437	1,022	260	357	167	189	95	78
16	219	258	1,327	375	470	950	282	296	166	161	95	76
17	224	227	1,722	345	655	932	248	287	164	155	95	10
18	224	234	1,614	345	540	905	279	265	170	226	95	10
19	219	614	1,452	375	437	857	319	245	167	198	89	57
20	222	844	1,197	375	405	780	366	237	166	152	10	48
21	219	813	977	405	375	695	412	237	167	139	10	44
22	219	677	844	407	375	620	411	219	164	372	79	66
23	219	544	754	375	345	563	451	237	166	418	76	101
24	204	533	620	345	345	523	675	258	172	256	76	100
25	187	787	580	345	287	548	861	243	176	211	73	87
26	176	1,167	556	237	287	635	941	277	169	169	76	83
27	174	1,243	540	237	345	582	932	266	163	148	10	75
28	172	1,115	524	237	405	537	776	237	164	133	10	73
29	302	949	500	237	------	474	675	222	161	122	85	70
30	354	808	464	287	------	455	597	213	164	117	76	59
31	376	------	464	237	------	415	------	201	------	114	76	------

NOTE—Discharge August 20, 21, 27, 28, September 4, 5, 17 and 18 estimated, because of leakage at control weir, and flashboards placed on the dam above gage temporarily held back a portion of the stream flow.

Monthly discharge of Wallenpaupack Creek at Wilsonville, for the year ending Sept. 30, 1921.
(Drainage area 227 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	2,470	172	541	2.38	2.74
November	1,243	227	615	2.27	2.53
December	2,503	464	1,043	4.60	5.30
January	540	228	350	1.54	1.78
February	655	197	333	1.47	1.53
March	3,254	254	1,131	4.98	5.74
April	941	237	440	1.94	2.16
May	578	201	358	1.58	1.82
June	197	161	174	.767	.86
July	530	99	185	.815	.94
August	164	10	94.5	.416	.48
September	101	10	64.5	.284	.32
The Year	3,254	10	438	1.93	26.20

DELAWARE BASIN—STATION NO. 3

SHOHOLA CREEK NEAR SHOHOLA

Location.—At single-span steel highway bridge about one and three-quarter miles south of Shohola, Pike County.

Drainage Area.—82 square miles.

Records Available.—February 19, 1919, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read once daily by Walter P. Hess.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank is high and not subject to overflow; left is of medium height and overflows during extremely high stages. Bed is composed of coarse gravel and large stones. Control is at the first of a series of riffles about 150 feet downstream from gage; probably permanent.

Extremes of Stage.—Maximum gage height during the year, 4.4 feet observed at 7.30 a. m. March 10; minimum, 0.9 foot at 6.30 a. m. September 6, 7 and 8.

Ice.—Stage-discharge relation probably affected by ice.

Discharge measurements of Shohola Creek near Shohola, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
2	May 20*	H. J. McIntyre	2.11	129
3	June 30†	J. M. Snavely	1.74	76.7
4	Sept. 15†	J. M. Snavely	1.07	8.42

* Measurement made by wading 100 feet below gage.
† Measurement made by wading 50 feet below gage.

Daily Mean Gage Height, in feet, of Shohola Creek near Shohola, for the year ending Sept. 30. 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.9	1.9	2.6	2.2	1.9	2.0	2.8	2.9	1.8	1.7	1.3	1.0
2	2.9	1.8	2.9	2.2	2.2	2.0	2.9	2.9	1.7	1.7	1.3	1.0
3	2.9	2.1	2.9	2.3	2.3	2.55	2.8	2.9	1.6	1.6	1.5	1.0
4	2.8	2.2	2.9	2.3	2.3	2.7	2.8	2.9	1.7	1.5	1.6	1.0
5	2.5	2.2	2.9	2.1	2.2	2.5	2.8	2.6	1.8	1.4	1.5	1.0
6	2.3	2.1	2.9	2.2	1.9	2.5	2.7	2.7	1.8	1.4	1.4	.9
7	2.1	2.0	2.9	2.2	2.0	2.8	2.5	2.6	1.7	1.4	1.3	.9
8	2.2	1.9	2.7	2.2	1.8	3.5	2.4	2.5	1.6	1.4	1.4	.9
9	2.2	1.9	2.5	2.2	2.0	3.95	2.4	2.5	1.6	1.3	1.6	1.0
10	2.1	1.9	2.5	2.2	1.8	4.4	2.3	2.4	1.5	1.45	1.5	1.0
11	2.0	1.9	2.4	2.1	1.8	4.2	2.4	2.3	1.5	1.9	1.5	1.0
12	1.9	1.8	2.3	2.1	1.7	3.6	2.4	2.2	1.5	2.0	1.5	1.0
13	1.9	1.8	2.4	2.1	2.0	3.4	2.2	2.4	1.5	1.9	1.4	1.0
14	1.9	1.7	2.4	2.0	2.0	3.2	2.1	2.5	1.5	1.5	1.3	1.0
15	1.9	1.7	3.0	2.3	1.9	3.3	2.2	2.4	1.5	1.5	1.3	1.0
16	1.9	1.8	3.1	2.3	1.8	3.3	2.2	2.3	1.4	1.9	1.4	1.0
17	2.0	2.2	3.2	2.2	2.1	2.9	2.5	2.3	1.4	1.7	1.4	1.0
18	2.0	2.2	2.8	2.2	2.1	2.8	2.9	2.2	1.5	1.5	1.2	1.0
19	1.9	2.3	2.5	2.2	2.0	2.8	2.9	2.1	1.5	1.5	1.2	1.0
20	1.9	2.3	2.5	1.9	1.9	2.6	2.7	2.1	1.4	1.7	1.2	1.0
21	1.9	2.2	2.5	1.9	2.0	2.7	2.5	2.1	1.4	2.1	1.2	1.0
22	1.8	2.1	2.5	2.0	2.1	2.6	2.5	2.1	1.4	1.9	1.2	1.3
23	1.8	3.1	2.4	2.0	1.9	2.5	2.4	2.0	1.3	1.6	1.2	1.5
24	1.7	2.9	2.5	2.0	1.9	2.4	3.0	2.0	1.4	1.5	1.2	1.5
25	1.7	2.9	2.4	1.9	1.8	2.8	3.2	2.1	1.4	1.4	1.2	1.3
26	1.7	2.8	2.4	1.5	1.7	3.0	3.1	2.2	1.3	1.4	1.2	1.3
27	1.7	2.6	2.4	1.5	1.8	3.1	2.8	2.1	1.3	1.3	1.2	1.3
28	2.0	2.5	2.5	1.4	1.9	2.8	2.7	2.0	1.4	1.3	1.2	1.0
29	2.1	2.4	2.5	2.1	-------	2.7	2 6	2 0	1.4	1.4	1.2	1.0
30	2.2	2.4	2.4	1.8	-------	2.7	2.8	2.0	1.5	1.4	1.1	1.0
31	2.2	-------	2.4	1.9	-------	2.6	-------	1.9	-------	1.4	1.1	-------

DELAWARE BASIN—STATION NO. 4

DELAWARE RIVER AT PORT JERVIS, N. Y.

Location.—At two-span steel highway bridge between Matamoras, Pa., and Port Jervis, Orange County, N. Y.

Drainage Area.—3,100 square miles.

Records Available.—October 12, 1904, to September 30, 1921.

Gage.—Staff in two sections; upper section vertical and attached to downstream end of left abutment; lower section inclined, about 30 feet downstream from upper section; read by John Bisland. Elevation of gage zero 414.89 feet, United States Geological Survey datum. Prior to June 20, 1914, a standard chain gage, attached to the downstream side of bridge, was used.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and do not overflow. Bed is composed of gravel; occasionally shifting.

Extremes of Discharge.—Maximum stage recorded during the year, 12.3 feet at 8 a. m. March 10 (discharge, 61,600 second-feet); minimum, 1.3 feet September 12 (discharge, 525 second-feet).

1904-1921; Maximum stage recorded, 16.0 feet at 8 a. m. March 28, 1914 (discharge, 92,700 second-feet); minimum, 0.60 foot at 8 a. m. September 22 and 23, 1908 (discharge, 175 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Rating curve well defined between 1,000 and 30,000 second-feet. Gage read to tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Cooperation.—Record furnished by United States Geological Survey Office, Albany, N. Y.

Discharge measurements of Delaware River at Port Jervis, N. Y., during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
76	Oct. 22	Covert & Howe	2.52	2,080
77	June 17	Howe & Lauterhahn	1.80	1,030
78	18	Howe & Lauterhahn	1.81	1,050
79	18	Howe & Lauterhahn	1.81	985

Daily Mean Gage Height, in feet, of Delaware River at Port Jervis, N. Y., for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.4	3.7	4.6	3.6	2.9	4.6	5.0	5.8	2.6	1.95	2.8	1.5
2	8.6	3.8	9.0	3.6	2.7	5.3	5.5	6.3	2.4	2.1	2.7	1.5
3	6.5	4.6	8.4	4.2	2.8	6.4	5.4	5.8	2.4	2.1	2.6	1.5
4	5.7	4.7	7.6	4.0	2.7	9.4	5.0	5.2	2.35	2.0	2.5	1.5
5	5.5	5.0	6.8	3.7	2.6	6.6	4.4	5.0	2.2	1.9	2.4	1.6
6	5.3	4.6	7.3	3.6	2.6	5.6	4.0	4.8	2.5	1.8	2.2	1.6
7	5.1	4.1	6.6	3.7	3.4	6.4	3.9	4.6	2.3	1.8	2.1	1.6
8	4.0	4.0	6.0	3.6	3.2	9.3	3.9	4.4	2.2	1.7	2.15	1.5
9	3.6	3.7	5.4	3.5	3.0	9.8	3.8	4.1	2.2	1.7	2.45	1.5
10	3.4	3.6	5.0	3.3	2.8	11.9	3.6	3.8	2.1	1.85	2.6	1.4
11	3.2	3.5	4.7	3.0	2.6	9.6	3.8	3.6	2.0	2.25	2.3	1.4
12	3.2	3.4	4.5	3.0	2.6	7.7	3.6	3.3	2.0	2.3	2.3	1.3
13	3.1	3.3	4.4	2.9	2.5	7.3	3.2	3.4	2.0	2.4	2.3	1.4
14	3.0	3.2	4.3	3.2	2.4	7.5	3.2	3.6	2.0	2.3	2.5	1.55
15	2.9	3.1	8.7	3.3	2.4	7.3	3.3	3.4	1.9	2.3	2.4	1.6
16	2.7	3.1	7.4	5.0	2.4	6.4	3.4	3.4	1.9	3.0	2.2	1.5
17	2.9	3.2	6.4	4.0	2.7	6.4	4.0	3.2	1.9	3.0	2.0	1.5
18	2.8	5.2	5.7	3.3	2.5	5.6	5.8	3.0	1.8	2.8	2.0	1.5
19	2.8	4.9	5.3	2.8	4.4	5.5	5.5	2.9	1.8	2.5	2.15	1.45
20	2.7	4.5	4.7	2.8	3.7	5.2	5.0	2.8	1.8	2.4	2.15	1.65
21	2.5	4.4	4.6	2.9	3.9	5.1	5.0	2.6	1.7	2.8	2.2	1.75
22	2.5	4.2	4.4	3.4	3.0	5.0	4.2	2.5	1.7	3.2	2.2	2.05
23	2.6	5.1	4.4	4.1	3.1	4.6	4.2	2.4	1.6	2.8	2.1	2.5
24	2.5	8.4	4.7	4.0	3.2	4.4	5.6	2.35	1.8	2.45	2.0	2.9
25	2.3	7.2	4.6	3.2	2.9	4.9	5.8	2.6	1.7	2.2	1.9	1.8
26	2.3	6.9	4.3	2.7	2.7	5.6	5.2	2.8	1.8	2.2	1.8	1.8
27	2.3	6.5	3.7	2.7	3.0	6.0	4.8	2.6	1.7	2.1	1.7	1.9
28	2.5	6.2	3.6	2.7	2.8	5.6	4.5	2.6	1.7	2.0	1.7	1.9
29	3.5	5.0	3.8	2.7	------	5.2	4.3	2.4	1.7	2.45	1.7	1.7
30	3.8	4.8	3.8	2.9	------	4.8	4.2	2.6	1.9	2.6	1.6	1.7
31	3.7	------	3.8	2.9	------	4.8	------	2.7	------	3.0	1.5	------

Daily discharge, in second-feet, of Delaware River at Port Jervis, N. Y., for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30,500	5,050	8,200	4,750	2,920	8,200	9,840	13,600	2,260	1,180	2,690	685
2	32,000	5,360	35,000	4,750	2,470	11,200	12,100	16,200	1,890	1,390	2,470	685
3	17,400	8,200	30,500	6,700	2,690	16,800	11,600	13,600	1,890	1,390	2,260	685
4	13,100	8,600	24,600	6,010	2,470	38,100	9,840	10,700	1,800	1,240	2,070	685
5	12,100	9,840	19,200	5,050	2,260	18,000	7,430	9,840	1,550	1,110	1,890	780
6	11,200	8,200	22,500	4,750	2,260	12,600	6,010	9,010	2,070	990	1,550	780
7	10,300	6,350	18,000	5,050	4,180	16,800	5,680	8,200	1,720	990	1,390	780
8	6,010	6,010	14,600	4,750	3,650	37,300	5,680	7,430	1,550	880	1,470	685
9	4,750	5,050	11,600	4,460	3,160	41,200	5,360	6,350	1,550	880	1,980	685
10	4,180	4,750	9,840	3,910	2,690	58,300	4,750	5,360	1,390	1,050	2,260	600
11	3,650	4,460	8,600	3,160	2,260	39,600	5,360	4,750	1,240	1,640	1,720	600
12	3,650	4,180	7,810	3,160	2,260	25.300	4,750	3,910	1,240	1,720	1,720	525
13	3,400	3,910	7,430	2,920	2,070	22,500	3,650	4,180	1,240	1,890	1,720	600
14	3,160	3,650	7,060	3,650	1,890	23,900	3,650	4,750	1,240	1,720	2,070	732
15	2,920	3,400	32,700	3,910	1,890	22,500	3,910	4,180	1,110	1,720	1,890	780
16	2,470	3,400	23,200	9,840	1,890	16.800	4,180	4,180	1,110	3,160	1,550	685
17	2,920	3,650	16,800	6,010	2,470	16,800	6,019	3,650	1,110	3,160	1,240	685
18	2,690	10,700	13,100	3,919	2,070	12,600	13,600	3,160	990	2,690	1,240	685
19	2,690	9,420	11,200	2,690	7,430	12,100	12,100	2,920	990	2,070	1,470	642
20	2,470	7,810	8,600	2,690	5,050	10,700	9,840	2,690	990	1,890	1,470	830
21	2,070	7,430	8,200	2,920	5,680	10,300	9,840	2,260	880	2,690	1,550	935
22	2,070	6,700	7,430	4,180	3.160	9,840	6,700	2,070	880	3,650	1,550	1,320
23	2,260	10,300	7,430	6,350	3,400	8,200	6,700	1,890	780	2,690	1,390	2,070
24	2,070	30,500	8,600	6,010	3,650	7,430	12,600	1,800	990	1,980	1,240	2,920
25	1,720	21,800	8,200	3,659	2,920	9,420	13,600	2,260	880	1,550	1,110	990
26	1,720	19,800	7,060	2,470	2,470	12,600	10,700	2,690	990	1,550	990	990
27	1,720	17,400	5,050	2,470	3,160	14,600	9,010	2,260	880	1,390	880	1,110
28	2,070	15.700	4,750	2,470	2,690	12,600	7,810	2,260	880	1,240	880	1,110
29	4.460	9,840	5,360	2,470	-------	10,700	7,060	1,890	880	1,980	880	880
30	5,360	9,010	5,360	2,920	-------	9,010	6,700	2,260	1,110	2,260	780	880
31	5,050	-------	5,360	2,920	-------	9,010	-------	2,470	-------	3,160	685	-------

Monthly discharge of Delaware River at Port Jervis, N. Y., for the year ending Sept. 30, 1921
(Drainage area 3,100 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	32,000	1,720	6,520	2.10	2.42
November	30,500	3,400	9,020	2.91	3.25
December	35,000	4,750	13,000	4.19	4.83
January	9,840	2,470	4,220	1.36	1.57
February	7,430	1,890	3,040	.981	1.02
March	58,300	7,430	18,500	5.97	6.88
April	13,600	3,650	7,870	2.54	2.83
May	16,200	1,800	5,250	1.69	1.95
June	2,260	780	1,270	.410	.46
July	3,650	880	1,840	.594	.68
August	2,690	685	1,550	.500	.58
September	2,920	525	901	.291	.32
The year	58,300	525	6,130	1.98	26.79

DELAWARE BASIN—STATION NO. 5

BUSHKILL CREEK NEAR SHOEMAKERS

Location.—At single-span steel highway bridge, about three-quarters of a mile northwest of Shoemakers, Monroe County.

Drainage Area.—115 square miles.

Records Available.—September 19, 1908, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Walter C. Haywood.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of gravel and boulders. Control is at the first of a series of riffles a short distance below gage; shifts occasionally.

Extremes of Discharge.—Maximum stage during the year, 4.50 feet observed at 7 a. m. March 10 (discharge, about 1,340 second-feet); minimum, 0.96 foot from 7 a. m. September 4 to 6 p. m. September 6 (discharge, 19 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation probably permanent throughout the year. Rating curve fairly well defined between 25 and 800 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Bushkill Creek near Shoemakers, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
34	May 1	H. J. McIntyre	2.93	642
35	May 2	O. W. Hartwell	2.81	514
36	June 28*	J. M. Snavely	1.27	43.8
37	Sept. 9	H. J. McIntyre	1.02	25.4

*Measurement made by wading 15 feet above gage.

Daily Mean Gage Height, in feet, of Bushkill Creek near Shoemakers, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.54	1.67	2.60	2.22	2.10	2.46	3.51	2.94	1.82	1.65	1.24	0.99
2	3.06	1.60	3.08	2.21	2.12	2.52	3.48	2.78	1.77	1.54	1.22	.97
3	2.80	2.03	2.92	2.28	2.11	2.78	3.20	2.66	1.74	1.48	1.52	.97
4	2.58	1.99	2.78	2.20	2.10	2.94	2.96	2.57	1.74	1.41	1.56	.96
5	2.43	1.92	2.74	2.17	1.96	2.82	2.80	2.78	1.68	1.39	1.40	.96
6	2.32	1.80	2.76	2.10	1.92	2.60	2.72	2.76	1.65	1.38	1.33	.96
7	2.22	1.78	2.62	2.04	1.97	2.78	2.66	2.63	1.61	1.35	1.30	.97
8	2.20	1.76	2.48	2.12	1.85	3.12	2.62	2.50	1.60	1.31	1.40	.98
9	2.11	1.74	2.40	2.14	1.82	3.50	2.62	2.42	1.58	1.28	1.42	1.00
10	2.06	1.70	2.37	2.00	1.78	4.38	2.58	2.34	1.56	1.28	1.36	1.00
11	1.98	1.66	2.32	2.02	1.80	3.75	2.47	2.30	1.50	1.46	1.29	1.00
12	1.95	1.63	2.29	1.98	1.78	3.52	2.39	2.25	1.58	1.55	1.30	1.04
13	1.93	1.58	2.28	1.89	1.74	3.50	2.34	2.58	1.54	1.50	1.28	1.18
14	1.84	1.55	2.75	2.20	1.70	3.45	2.30	2.58	1.51	1.44	1.22	1.16
15	1.77	1.56	3.40	2.80	1.64	3.28	2.34	2.46	1.46	1.64	1.20	1.10
16	1.74	1.70	3.16	2.56	1.72	3.18	2.54	2.36	1.41	1.58	1.19	1.12
17	1.73	2.15	3.00	2.34	1.84	3.07	2.84	2.23	1.42	1.48	1.16	1.00
18	1.77	2.22	2.88	2.20	1.88	2.93	2.92	2.16	1.46	1.38	1.20	1.00
19	1.75	2.10	2.72	2.26	1.76	2.78	2.80	2.14	1.40	1.31	1.19	1.00
20	1.74	2.00	2.54	2.26	1.80	2.70	2.73	2.06	1.38	1.46	1.15	1.00
21	1.70	2.00	2.49	2.22	1.85	2.61	2.64	2.02	1.38	1.48	1.14	1.09
22	1.68	1.99	2.48	2.22	1.90	2.53	2.54	1.98	1.34	1.41	1.09	1.36
23	1.64	2.53	2.71	2.22	1.87	2.43	2.68	2.08	1.33	1.36	1.06	1.42
24	1.60	2.54	2.53	2.14	1.86	2.42	3.35	2.08	1.33	1.44	1.06	1.30
25	1.59	2.44	2.50	1.98	1.90	3.04	3.05	2.10	1.31	1.30	1.04	1.18
26	1.55	2.38	2.40	2.00	1.90	3.15	2.92	2.27	1.28	1.32	1.00	1.16
27	1.58	2.30	2.38	2.12	1.88	2.98	2.80	2.18	1.28	1.58	1.00	1.14
28	1.70	2.28	2.32	2.14	2.42	2.85	2.68	2.11	1.28	1.39	1.00	1.09
29	1.88	2.25	2.28	2.10	------	2.78	2.5	1.95	1.40	1.38	1.00	1.05
30	1.80	2.23	2.37	2.00	------	2.64	2.73	1.96	1.85	1.34	1.00	1.04
31	1.73	------	2.25	2.02	------	2.63	------	1.88	------	1.27	.98	------

Daily discharge, in second-feet, of Bushkill Creek near Shoemakers, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	875	90	476	274	220	386	875	616	126	86	37	20
2	687	76	687	270	229	405	875	546	113	68	36	20
3	546	180	593	302	224	546	734	476	106	60	65	20
4	452	177	546	265	220	616	616	428	106	52	70	19
5	372	154	522	252	167	546	546	546	92	50	51	19
6	320	120	522	220	154	499	499	522	86	49	45	19
7	274	115	452	196	170	546	476	476	78	46	42	20
8	265	110	396	229	134	687	452	405	76	43	51	20
9	224	106	358	238	126	875	452	367	73	40	53	21
10	204	96	344	180	115	1,300	452	330	70	40	47	21
11	174	88	320	188	120	1,020	391	311	62	53	41	21
12	164	82	306	174	115	875	353	288	73	69	42	23
13	158	73	302	145	106	875	330	452	68	62	40	33
14	131	69	522	265	96	828	311	452	63	55	36	31
15	113	70	828	546	84	781	330	386	58	84	34	27
16	106	96	734	428	101	734	428	339	52	73	33	28
17	103	242	640	330	131	687	570	279	53	60	31	21
18	113	274	593	265	142	616	593	247	58	49	34	21
19	108	220	499	293	110	546	546	238	51	43	33	21
20	106	180	428	293	120	499	522	204	49	58	30	21
21	96	180	400	274	134	476	476	188	49	60	30	26
22	92	177	396	274	148	452	428	174	46	52	26	47
23	84	428	499	274	140	396	499	212	45	47	25	53
24	76	428	428	238	137	367	828	212	45	55	25	42
25	75	377	405	174	148	640	640	220	43	42	23	33
26	69	349	358	180	148	734	593	297	40	44	21	31
27	73	311	349	229	142	640	546	256	40	73	21	30
28	110	302	320	238	367	570	499	224	40	50	21	26
29	142	288	302	220	------	546	452	164	51	49	21	24
30	120	279	344	180	------	476	522	167	134	46	21	23
31	103	------	288	188	------	476	------	142	------	40	20	------

Monthly discharge of Bushkill Creek near Shoemakers, for the year ending Sept. 30, 1921.

(Drainage area 115 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	875	69	211	1.83	2.11
November	428	69	191	1.66	1.85
December	828	288	457	3.97	4.58
January	546	145	252	2.19	2.52
February	367	84	152	1.32	1.38
March	1,300	367	634	5.51	6.35
April	875	311	528	4.59	5.12
May	616	142	328	2.85	3.29
June	134	40	68.2	.593	.66
July	86	40	54.9	.477	.55
August	70	20	35.6	.310	.36
September	53	19	26.0	.226	.25
The Year	1,300	19	246	2.14	29.02

DELAWARE BASIN—STATION NO. 6

McMICHAELS CREEK NEAR STROUDSBURG

Location.—At single-span steel railroad bridge, Wilkes-Barre & Eastern R. R. car shops, about three-quarters of a mile southwest of Stroudsburg, Monroe County.

Drainage Area.—62 square miles.

Records Available.—August 10, 1911, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by H. Q. Snyder.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of silt and stones. Control for medium and low stages is at a gravel and boulder bar, where there is a pronounced fall in the stream, about 600 feet below the gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 5.4 feet at 6 a. m. March 25 (discharge, 853 second-feet); minimum, 2.51 feet at 8.10 a. m. August 25 (discharge, 20 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation probably permanent throughout the year. Rating curve fairly well defined between 25 and 800 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of McMichaels Creek near Stroudsburg, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
35	Apr. 30	H. J. McIntyre	3.82	206
36	May 1	H. J. McIntyre	4.00	284
37	2	H. J. McIntyre	3.80	222
38	June 28	J. M. Snavely	2.84	42.3
39	Sept. 9	H. J. McIntyre	2.65	27.0

Daily Mean Gage Height, in feet, of McMichaels Creek near Stroudsburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.92	2.93	3.84	3.52	3.44	4.30	4.84	3.91	3.07	3.19	-------	2.62
2	3.68	2.95	4.26	3.54	3.34	4.40	4.38	3.81	3.08	3.01	-------	2.64
3	-------	2.85	4.14	3.50	3.27	5.04	4.22	3.80	3.08	-------	2.94	2.65
4	3.38	3.00	4.02	-------	3.19	4.98	4.08	3.78	3.28	2.93	3.06	2.62
5	3.29	2.96	4.16	3.40	3.10	4.46	3.98	4.58	-------	2:82	2.85	2.65
6	3.24	2.94	3.92	3.30	3.07	4.35	3.88	4.20	3.05	2.84	2.81	2.62
7	3.20	-------	3.76	3.30	3.21	4.34	3.82	4.09	2.97	2.83	2.81	2.77
8	3.18	3.10	3.54	3.39	3.20	4.32	3.70	-------	3.05	2.78	2.86	2.65
9	3.12	2.98	3.51	3.32	3.20	4.56	3.91	3.83	2.98	2.72	2.74	2.64
10	-------	2.98	3.68	3.25	3.10	4.64	-------	3.82	2.98	-------	2.70	2.62
11	3.14	2.91	3.63	3.25	3.16	4.34	3.60	3.76	3.00	2.74	2.62	-------
12	3.11	2.95	3.43	3.16	3.16	4.24	3.56	3.81	2.92	2.85	2.64	2.70
13	3.10	2.95	3.53	3.15	-------	-------	3.52	4.17	2.98	2.84	2.90	2.64
14	3.08	-------	4.80	3.78	3.28	4.10	3.47	3.68	2.93	2.78	2.83	2.62
15	3.09	2.95	4.53	4.22	3.24	4.08	3.53	3.61	2.90	3.09	2.72	2.64
16	3.08	3.08	4.34	-------	3.25	4.10	3.51	3.54	2.88	3.06	2.74	2.62
17	-------	3.96	4.08	3.50	3.29	3.90	-------	3.47	2.88	2.85	2.74	2.66
18	3.06	3.36	3.90	3.60	3.25	3.82	3.52	3.40	2.88	2.85	2.74	2.68
19	3.05	3.26	3.82	3.82	3.17	3.66	3.52	3.38	-------	2.85	2.68	2.65
20	3.02	3.26	3.68	3.78	-------	3.74	3.44	3.38	2.84	3.07	2.63	2.66
21	3.00	-------	3.62	3.56	3.22	3.72	3.46	3.36	2.83	2.88	2.63	2.78
22	2.96	3.35	3.66	3.57	3.25	3.65	3.44	-------	2.78	2.88	2.62	3.15
23	2.92	4.06	4.26	-------	3.25	3.62	3.94	3.27	2.95	2.87	2.62	2.70
24	-------	3.72	3.81	3.46	3.21	3.78	3.95	3.22	2.77	-------	2.58	2.64
25	2.98	-------	3.74	3.24	3.30	4.73	3.82	3.30	2.76	-------	2.54	-------
26	2.96	3.52	3.68	3.32	3.32	4.25	3.74	3.22	2.76	-------	2.56	2.71
27	3.02	3.50	3.70	3.34	3.36	4.14	3.69	3.20	2.77	-------	2.62	2.74
28	3.29	-------	3.66	3.30	3.78	4.11	3.70	3.17	2.74	-------	-------	2.64
29	3.06	3.42	3.63	3.24	-------	3.96	3.64	3.18	3.72	-------	2.63	2.64
30	2.94	3.32	3.50	-------	-------	3.90	3.83	3.18	3.58	-------	2.62	2.62
31	-------	-------	3.54	3.38	-------	3.90	-------	3.12	-------	-------	2.64	-------

NOTE—Gage height not observed on days of no record.

Daily discharge, in second-feet, of McMichaels Creek near Stroudsburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	240	51	226	139	127	380	580	240	67	84	33	25
2	185	54	362	150	108	418	418	211	69	60	32	26
3	150	43	325	139	96	667	343	211	69	56	52	27
4	115	59	272	129	84	667	307	211	98	51	66	25
5	99	55	325	119	71	438	272	497	82	40	43	27
6	91	52	240	101	67	399	240	343	65	42	39	25
7	85	62	198	101	87	399	211	307	56	41	39	36
8	82	71	150	117	85	380	185	266	65	36	44	27
9	74	57	139	105	85	497	240	226	57	32	33	26
10	76	57	185	93	71	497	200	211	57	32	30	25
11	77	49	173	93	79	399	161	198	59	33	25	28
12	72	54	125	79	79	362	150	211	50	43	26	30
13	71	54	150	78	88	334	139	325	57	42	48	26
14	69	54	580	211	98	307	133	185	51	36	41	25
15	70	54	457	343	91	307	150	161	48	70	32	26
16	69	69	399	241	93	307	139	150	46	66	33	25
17	68	256	307	139	99	240	139	133	46	43	33	28
18	66	112	240	161	93	211	139	119	46	43	33	29
19	65	95	211	211	81	173	139	115	44	43	29	27
20	61	95	185	211	84	198	127	115	42	67	26	28
21	59	102	161	150	88	185	131	112	41	46	26	36
22	55	110	173	150	93	173	127	104	36	46	25	78
23	50	290	362	140	93	161	256	96	54	45	25	30
24	54	185	211	131	87	211	256	88	36	49	23	26
25	57	162	198	91	101	538	211	101	35	39	21	28
26	55	139	185	105	105	362	198	88	35	42	22	31
27	61	139	185	108	112	325	185	85	36	67	25	33
28	99	131	173	101	211	307	185	81	33	46	26	26
29	66	123	173	91	-------	256	173	82	185	44	26	26
30	52	105	139	103	-------	240	226	82	161	40	25	25
31	52	-------	150	115	-------	240	-------	74	-------	36	26	-------

NOTE—Discharge Oct. 3, 10, 17, 24 and 31; Nov. 7, 14, 21, 25 and 28; Jan. 4, 16, 23 and 30; Feb. 13 and 20; Mar. 13; Apr. 10 and 17; May 8 and 22; Jan. 5 and 19; July 3 and 10; Aug. 28 and Sept. 11 and 25 interpolated, because of no gage height record. Discharge July 24 to Aug. 2 estimated, because of no gage height record, from discharge of Bushkill Creek near Shoemakers.

Monthly discharge of McMichaels Creek near Stroudsburg, for the year ending Sept. 30, 1921

(Drainage area 62 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	240	50	82.1	1.32	1.52
November	290	43	98.0	1.58	1.76
December	580	125	237	3.82	4.40
January	343	78	137	2.21	2.55
February	211	67	91.9	1.53	1.59
March	667	161	341	5.50	6.34
April	580	127	212	3.42	3.82
May	497	74	175	2.82	3.25
June	185	33	60.9	.982	1.10
July	82	32	47.1	.760	.88
August	66	21	32.5	.524	.60
September	78	25	29.3	.473	.53
The year	667	21	130	2.10	28.34

DELAWARE BASIN—STATION NO. 7

LEHIGH RIVER AT TANNERY

Location.—At single-span steel highway bridge, Tannery, Carbon County.

Drainage Area.—335 square miles.

Records Available.—June 23, 1914, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by G. D. Heimbach. Elevation of gage zero 1,029.41 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and large stones. Control is at a riffle about 300 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 7.5 feet at 3 a. m. March 10 (discharge, 5,600 second-feet); minimum, 2.48 feet at 8 a. m. September 4 (discharge, 96 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined between 150 and 3,000 second-feet. Gage read to hundredths daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

The following discharge measurement was made by H. J. McIntyre:

No. 22, May 15: Gage height, 4.50 feet; discharge, 1,090 second-feet.

Daily Mean Gage Height, in feet, of Lehigh River at Tannery, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.12	3.48	4.68	4.00	3.50	4.65	5.08	5.93	3.52	3.18	3.18	2.68
2	5.45	3.48	5.95	3.99	3.65	4.75	4.85	5.85	3.42	3.14	3.22	2.80
3	4.72	4.58	5.88	4.14	3.64	5.01	4.78	5.55	3.42	3.10	3.90	2.75
4	4.54	4.45	5.35	4.02	3.62	5.76	4.68	5.42	3.85	3.08	3.80	2.54
5	4.28	4.15	5.10	3.92	3.58	5.71	4.55	5.60	3.62	3.02	3.55	2.72
6	3.90	3.98	4.94	3.78	3.58	5.20	4.57	4.90	3.48	2.95	3.38	2.78
7	3.82	3.80	4.78	3.59	3.68	5.55	4.53	4.68	3.42	2.92	3.18	2.76
8	3.72	3.80	4.62	3.85	3.58	6.52	4.49	4.62	3.33	2.92	3.75	2.79
9	3.57	3.76	4.45	3.70	3.66	6.83	4.42	4.65	3.28	2.88	3.55	2.62
10	3.42	3.76	4.32	3.66	3.58	7.20	4.38	4.52	3.22	3.35	3.39	2.59
11	3.41	3.71	4.22	3.60	3.51	6.63	4.32	4.58	3.19	3.81	3.30	2.58
12	3.39	3.64	4.12	3.64	3.54	5.88	4.22	4.58	3.17	4.02	3.18	3.06
13	3.38	3.48	4.09	3.50	3.54	5.80	4.18	4.74	3.12	3.52	3.85	2.88
14	3.79	3.41	5.35	3.65	3.58	5.80	4.11	4.68	3.08	3.32	3.52	2.72
15	3.78	3.40	6.45	4.38	3.48	5.85	4.12	4.55	3.06	3.68	3.35	2.70
16	3.72	3.68	6.00	4.28	3.68	5.78	4.29	4.38	3.04	3.72	3.28	2.58
17	3.66	3.96	5.48	4.10	4.02	5.34	4.95	4.12	3.00	3.45	3.25	2.60
18	3.46	4.22	4.92	3.85	4.00	5.08	4.78	3.81	3.08	3.38	3.22	2.70
19	3.22	4.11	4.65	3.58	3.70	4.85	4.68	3.68	2.96	3.32	3.19	2.82
20	3.08	4.02	4.50	4.10	3.76	4.92	4.58	3.56	2.96	3.90	3.13	2.77
21	3.01	3.96	4.38	4.02	3.68	4.75	4.48	3.48	2.91	3.70	3.02	2.95
22	3.01	4.00	4.28	4.01	3.86	4.64	4.42	3.48	2.82	3.52	3.02	3.62
23	2.99	4.76	4.72	4.07	3.77	4.58	4.88	3.90	2.98	3.34	3.01	3.42
24	2.98	5.04	4.75	3.93	3.65	4.54	5.58	3.89	2.92	3.25	2.96	3.13
25	3.08	4.82	4.45	3.55	3.51	5.38	5.35	3.83	2.82	3.18	2.85	3.02
26	3.04	4.55	4.44	3.53	3.48	5.42	5.02	4.05	2.76	3.13	2.72	3.00
27	3.04	4.28	4.55	3.57	3.50	5.15	4.85	3.88	2.96	3.08	2.71	2.90
28	3.75	4.18	4.45	3.68	4.08	5.05	4.72	3.82	2.90	3.04	2.74	2.92
29	3.85	4.11	4.18	3.81	-------	4.85	4.66	3.79	3.16	3.11	2.75	2.94
30	3.77	4.02	4.18	3.48	-------	4.62	5.09	3.72	3.32	3.16	2.74	2.96
31	3.62	-------	4.08	3.62	-------	4.62	-------	3.62	-------	3.16	2.66	-------

NOTE—Stage-discharge relation Jan. 21-24 affected by ice.

Daily discharge, in second-feet, of Lehigh River at Tannery, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,050	371	1,280	680	380	1,180	1,710	2,750	380	253	253	117
2	2,070	371	2,900	680	457	1,380	1,380	2,610	344	239	267	140
3	1,280	1,180	2,750	790	457	1,600	1,380	2,330	344	225	610	129
4	1,090	1,040	2,070	680	430	2,610	1,280	2,070	578	219	545	102
5	910	790	1,710	610	430	2,470	1,180	2,330	430	201	405	123
6	610	680	1,490	545	430	1,830	1,180	1,490	371	180	327	136
7	545	545	1,380	430	485	2,330	1,090	1,280	344	17	253	131
8	485	545	1,180	578	430	3,700	1,090	1,180	307	17	515	138
9	405	515	1,040	485	457	4,230	1,000	1,180	288	15.	405	111
10	344	515	910	457	430	4,990	1,000	1,090	267	31.	331	107
11	340	485	830	430	380	3,870	910	1,180	256	545	295	106
12	331	457	750	457	405	2,750	830	1,180	250	68	253	213
13	327	371	750	380	405	2,610	830	1,280	232	38.	578	159
14	545	340	2,070	457	430	2,610	750	1,280	219	303	380	123
15	545	335	3,530	1,000	371	2,610	750	1,180	213	485	315	119
16	485	485	2,900	910	485	2,610	910	1,000	207	485	288	106
17	457	645	2,200	750	680	1,950	1,600	750	195	358	278	109
18	362	830	1,490	578	680	1,710	1,380	545	219	327	267	119
19	267	750	1,180	430	485	1,380	1,280	485	183	303	256	144
20	219	680	1,090	750	515	1,490	1,180	405	183	610	236	133
21	198	645	1,000	480	485	1,380	1,090	371	168	485	201	180
22	198	680	910	700	578	1,180	1,000	371	144	380	201	430
23	192	1,380	1,280	600	515	1,180	1,490	610	189	311	198	344
24	189	1,600	1,380	460	457	1,090	2,330	610	171	278	183	236
25	219	1,380	1,040	405	380	2,070	2,070	578	144	253	152	201
26	207	1,180	1,040	405	371	2,070	1,600	715	131	236	123	195
27	207	910	1,180	405	380	1,830	1,380	610	183	219	121	165
28	515	830	1,040	485	750	1,600	1,280	545	165	207	127	171
29	578	750	830	545	-------	1,380	1,280	545	246	228	129	177
30	515	680	830	371	-------	1,180	1,710	485	303	246	127	183
31	430	-------	750	430	-------	1,180	-------	430	-------	246	115	-------

NOTE—Discharge Jan. 21-24 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Lehigh River at Bethlehem.

Monthly discharge of Lehigh River at Tannery, for the year ending Sept. 30, 1921

(Drainage area 335 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	3,050	189	584	1.74	2.01
November	1,600	335	752	2.18	2.43
December	3,530	750	1,440	4.30	4.96
January	1,000	360	560	1.67	1.92
February	750	371	469	1.40	1.46
March	4,990	1,180	2,130	6.36	7.33
April	2,330	750	1,260	3.76	4.20
May	2,750	371	1,080	3.22	3.71
June	578	131	255	.761	.85
July	680	171	313	.934	1.08
August	610	115	282	.842	.97
September	430	102	162	.484	.54
The year	4,990	102	777	2.32	31.46

DELAWARE BASIN—STATION NO. 8

LITTLE LEHIGH CREEK AT ALLENTOWN

Location.—At three-span concrete highway bridge, Lehigh Street, Allentown, Lehigh County, about 2,500 feet above the confluence of Little Lehigh and Jordan creeks.

Drainage Area.—106 square miles.

Records Available.—April 29, 1921, to September 30, 1921.

Gage.—Staff attached to downstream end of left pier; read to hundredths twice daily by Nelson Schantz; during high stages more frequently.

Discharge Measurements.—Made from downstream side of trolley bridge, which is just below the gage, or by wading.

Channel and Control.—Channel is confined by retaining walls and brick buildings. Bed is composed of small gravel. Control was at a riffle about 100 feet below the gage previous to the high water of July 20, at which time a large quantity of sand and gravel was deposited from the original control, forming a new one a short distance below the gage.

Extremes of Stage.—Maximum gage height during the period, estimated from hydrograph, 8.0 feet at 2 a. m. July 20; minimum, 0.82 foot at 9 a. m. September 11.

Ice.—Stage-discharge relation probably affected by ice.

Cooperation.—Station is maintained in cooperation with the American Steel and Wire Company.

Discharge Measurements of Little Lehigh Creek at Allentown, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
1	Apr. 29*	H. J. McIntyre	1.15	131
2	May 2†	H. J. McIntyre	1.15	128
	21*	H. J. McIntyre	1.08	119
4	June 24†	J. M. Snavely	.91	98.5
5	Sept. 9*	H. J. McIntyre	.88	81.6

* Measurement made by wading 15 feet below gage.
† Measurement made by wading 10 feet below gage.

Daily Mean Gage Height, in feet, of Little Lehigh Creek at Allentown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	------	------	------	------	------	------	1.23	1.04	0.97	1.00	0.92
2	------	------	------	------	------	------	------	1.18	1.04	.99	1.01	.91
3	------	------	------	------	------	------	------	1.12	1.03	.97	1.25	.89
4	------	------	------	------	------	------	------	1.28	1.06	.96	1.18	.85
5	------	------	------	------	------	------	------	2.37	1.02	.92	.98	.96
6	------	------	------	------	------	------	------	1.70	1.05	.92	.96	.88
7	------	------	------	------	------	------	------	1.44	1.05	.93	.98	.97
8	------	------	------	------	------	------	------	1.29	1.03	.96	1.33	.93
9	------	------	------	------	------	------	------	1.25	1.05	.90	1.03	.89
10	------	------	------	------	------	------	------	1.29	1.02	.92	.99	.89
11	------	------	------	------	------	------	------	1.17	1.01	.98	.97	.83
12	------	------	------	------	------	------	------	1.17	1.00	.96	.96	.96
13	------	------	------	------	------	------	------	1.62	1.02	.91	.99	.90
14	------	------	------	------	------	------	------	1.31	1.04	.88	.96	.90
15	------	------	------	------	------	------	------	1.19	1.04	.96	.98	.92
16	------	------	------	------	------	------	------	1.18	1.00	.96	.96	.94
17	------	------	------	------	------	------	------	1.14	.98	.88	.95	.97
18	------	------	------	------	------	------	------	1.13	.98	1.01	.97	.88
19	------	------	------	------	------	------	------	1.15	.95	1.53	.92	.96
20	------	------	------	------	------	------	------	1.12	.98	4.73	.94	.87
21	------	------	------	------	------	------	------	1.08	.97	1.36	.92	1.00
22	------	------	------	------	------	------	------	1.08	.95	1.12	.96	1.46
23	------	------	------	------	------	------	------	1.19	.90	1.07	.93	1.01
24	------	------	------	------	------	------	------	1.11	.95	1.05	.90	.98
25	------	------	------	------	------	------	------	1.11	.88	1.05	.93	.95
26	------	------	------	------	------	------	------	1.14	.88	1.00	.90	.99
27	------	------	------	------	------	------	------	1.08	.94	.99	.92	.92
28	------	------	------	------	------	------	------	1.09	.95	.98	.87	.97
29	------	------	------	------	------	------	1.13	1.12	1.01	1.02	.87	.94
30	------	------	------	------	------	------	1.18	1.09	1.28	1.01	.92	.93
31	------	------	------	------	------	------	------	1.08	------	.98	.94	------

DELAWARE BASIN—STATION NO. 9

LEHIGH RIVER AT BETHLEHEM

Location.—At nine-span steel highway bridge, three spans over the normal river channel, New Street, Bethlehem, Northampton County, about 800 feet upstream from the mouth of Monocacy Creek and about 5 miles downstream from the mouth of Jordan Creek.

Drainage Area.—1,240 square miles.

Records Available.—September 22, 1902, to February 13, 1905, and April 26, 1909, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by William E. Roberts. Elevation of gage zero 210.64 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Right bank is high and not subject to overflow; left is low and subject to overflow at high stages. Bed is composed of sand and gravel. Control is at a riffle about 1,000 feet below gage; shifts occasionally. Monocacy Creek enters from left just below the low-water control.

Extremes of Discharge.—Maximum stage during the year, 6.72 feet observed at 8.30 a. m. March 4 (discharge, 10,200 second-feet); minimum, estimated from Allentown record, 1.59 feet, September 16 (discharge, 425 second-feet).

Ice.—Stage-discharge relation seldom affected by ice.

Diversions.—During navigation season water is diverted past the gage through the Lehigh Coal and Navigation Company Canal, which follows the left bank and passes under the left span of bridge.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined between 300 and 31,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good for medium and high stages; only fair for low stages owing to uncertain amount of water diverted by canal.

Discharge Measurements of Lehigh River at Bethlehem, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
62	Apr. 29	O. W. Hartwell and H. J. McIntyre	3.82	3,140
63	Sept. 8	H. J. McIntyre	1.88	640

Daily Mean Gage Height, in feet, of Lehigh River at Bethlehem, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.77	2.09	3.77	3.12	2.61	5.28	4.82	4.60	2.52	------	------	------
2	4.82	2.18	5.56	3.12	------	5.29	4.68	4.48	2.42	------	------	------
3	4.04	2.41	5.28	3.26	------	6.08	4.45	4.15	2.35	------	------	------
4	3.56	2.39	4.66	3.21	------	6.61	4.18	4.72	2.65	------	------	------
5	3.28	2.40	4.38	3.16	------	6.38	3.92	5.37	2.45	------	------	------
6	3.06	2.41	4.18	3.04	2.92	5.71	3.78	5.00	2.45	------	------	------
7	2.84	2.44	3.94	2.79	2.88	5.11	3.68	4.62	2.40	------	------	------
8	2.81	2.46	3.71	2.90	2.66	4.88	3.61	4.40	2.35	------	------	------
9	2.74	2.36	3.48	2.88	2.72	5.45	3.60	3.98	2.30	------	------	------
10	2.49	2.37	3.58	2.86	2.76	6.38	3.58	3.86	2.20	------	------	------
11	2.49	2.38	3.32	2.86	2.78	5.72	3.48	3.62	2.10	------	------	------
12	2.51	2.35	3.20	2.86	2.68	6.26	3.48	3.59	2.05	------	------	------
13	2.49	2.33	3.27	2.89	2.40	4.95	3.19	4.27	2.05	------	------	------
14	2.46	2.33	4.62	3.50	2.44	4.68	3.15	3.97	2.00	------	------	------
15	2.54	2.34	5.22	4.95	3.02	4.38	3.22	3.72	1.90	------	------	------
16	2.46	2.56	4.81	3.97	2.81	5.02	3.65	3.60	1.90	------	------	------
17	2.32	3.68	4.57	3.81	2.79	4.63	3.65	3.50	2.02	------	------	------
18	2.41	3.78	4.34	3.66	2.74	4.36	3.78	3.38	2.08	------	------	------
19	2.44	3.16	4.26	3.45	2.69	4.04	3.74	3.15	2.00	------	------	------
20	1.96	2.92	4.05	3.22	2.74	3.88	3.31	3.10	2.05	------	------	------
21	1.94	2.94	4.84	3.07	2.81	3.76	3.30	3.05	2.00	------	------	------
22	2.04	3.06	3.88	3.68	2.84	3.81	3.32	3.00	1.95	------	------	------
23	1.92	3.82	3.82	3.32	2.78	3.92	4.02	2.95	1.90	------	------	------
24	1.82	3.99	3.86	3.26	2.71	4.61	5.47	2.95	1.85	------	------	------
25	1.85	3.84	3.84	3.19	2.61	5.53	4.98	3.00	1.75	------	------	------
26	1.86	3.65	3.39	3.05	2.48	5.08	4.62	2.95	1.70	------	------	------
27	2.00	3.52	3.42	2.77	2.92	4.77	4.38	2.95	1.70	------	------	------
28	2.29	3.30	3.40	2.57	4.73	4.44	4.22	2.90	1.81	------	------	------
29	2.26	3.24	3.28	2.59	------	4.58	4.00	2.85	2.52	------	------	------
30	2.25	3.14	3.18	2.72	------	4.46	4.24	2.80	2.70	------	------	------
31	2.25	------	3.12	2.81	------	4.78	------	2.70	------	------	------	------

NOTE—Gage height Feb. 2-5, July 1 to Aug. 20 and Sept. 8-30 unsatisfactory; Aug. 21 to Sept. 7 not observed.

Daily discharge, in second-feet, of Lehigh River at Bethlehem, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,730	780	3,130	1,930	1,290	6,450	5,270	4,810	1,180	1,040	660	440
2	5,270	870	7,210	1,930	1,050	6,450	5,040	4,580	1,070	740	930	435
3	3,520	1,070	6,450	2,240	900	8,550	4,360	3,930	1,020	740	1,200	435
4	2,760	1,070	5,040	2,080	850	9,950	3,930	5,040	1,350	600	1,550	430
5	2,240	1,070	4,360	2,080	1,000	9,390	3,320	6,700	1,120	550	1,200	435
6	1,930	1,070	3,930	1,790	1,660	7,470	3,130	5,730	1,120	480	930	435
7	1,660	1,120	3,320	1,530	1,660	5,970	2,940	4,810	1,070	480	740	460
8	1,530	1,120	2,940	1,660	1,350	5,500	2,760	4,360	1,020	480	1,200	450
9	1,470	1,020	2,580	1,660	1,410	6,700	2,760	3,520	970	550	930	440
10	1,180	1,020	2,760	1,600	1,470	9,390	2,760	3,320	870	740	740	440
11	1,180	1,070	2,240	1,600	1,530	7,470	2,580	2,760	780	1,370	660	430
12	1,180	1,020	2,080	1,600	1,410	9,110	2,580	2,760	735	1,370	660	435
13	1,180	1,020	2,240	1,660	1.070	5,730	2,080	4,140	735	1,200	660	435
14	1,120	1,020	4,810	2,580	1,120	5,040	2,080	3,520	690	740	740	430
15	1,240	1,020	6,210	5,730	1,790	4,360	2,080	2,940	610	660	740	430
16	1,120	1,240	5,270	3,520	1,530	5,730	2,760	2,760	610	1,760	930	425
17	970	2,940	4,810	3,130	1,530	4,810	2,760	2,580	600	1,370	600	425
18	1,070	3,130	4,140	2,940	1,470	4,360	3,130	2,410	780	740	660	430
19	1,120	2,080	4,140	2,410	1,410	3,520	2,940	2,080	690	660	740	430
20	650	1,660	3,520	2,080	1,470	3,320	2,240	1,930	735	9,940	660	430
21	650	1,720	5,270	1,930	1,530	3,130	2,240	1,790	690	930	660	460
22	735	1,930	2,410	2,940	1,600	3,130	2,240	1,790	650	740	660	830
23	610	3,130	3,130	2,240	1,530	3,320	3,520	1,720	610	740	600	600
24	540	3,520	3,320	2,240	1,410	4,810	6,950	1,720	575	660	510	550
25	575	3,130	3,130	2,080	1,250	6,950	5,730	1,790	510	660	460	510
26	575	2,760	2,410	1,790	1,180	5,970	4,810	1,720	480	480	460	480
27	690	2,580	2,410	1,470	1,660	5,270	4,360	1,720	480	430	480	480
28	970	2,240	2,410	1,240	5,040	4,360	3,930	1,660	540	420	460	480
29	920	2,080	2,240	1,180	------	4,810	3,520	1.600	1,180	430	450	460
30	920	1,930	2,080	1,410	------	4,580	3,930	1,530	1,410	660	450	440
31	920	------	1,930	1,520	------	5,270	------	1,410	------	550	440	------

NOTE—Discharge does not include the water diverted past the gage through the Lehigh Coal & Navigation Company canal. Canal was closed Dec. 2 to Apr. 17. Discharge Feb. 2-5 estimated, because of unsatisfactory gage height record, from discharge of Lehigh River at Tannery and Schuylkill River at Reading. Discharge July 1 to Aug. 20 and Sept. 8-30, because of unsatisfactory gage height record, and Aug. 21 to Sept. 7, because of no gage height record, estimated from U. S. Weather Bureau gage heights of Lehigh River at Allentown.

Monthly discharge of Lehigh River at Bethlehem, for the year ending Sept. 30, 1921

(Drainage area 1,240 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	7,730	540	1,550	1.25	1.44
November	3,520	780	1,710	1.38	1.54
December	7,210	1,930	3,610	2.91	3.36
January	5,730	1,180	2,120	1.71	1.97
February	5,040	850	1,510	1.22	1.27
March	9,950	3,130	5,830	4.70	5.42
April	6,950	2,080	3,420	2.76	3.08
May	6,700	1,410	3,000	2.42	2.79
June	1,410	480	832	.671	.75
July	9,940	430	1,060	.855	.99
August	1,550	440	734	.592	.68
September	830	*425	467	.377	.42
The Year	9,950	425	2,170	1.75	23.71

NOTE—Discharge and run-off does not include the water diverted past the gage through the Lehigh Coal and Navigation Company Canal. Canal was closed Dec. 2 to Apr. 17.
* Estimated.

DELAWARE BASIN—STATION NO. 10

DELAWARE RIVER AT RIEGELSVILLE

Location.—At three-span suspension highway bridge between Riegelsville, Bucks County, Pa., and Riegelsville, Warren County, N. J., about 900 feet upstream from mouth of Musconetong River.

Drainage Area.—6,430 square miles.

Records Available.—July 3, 1906, to September 30, 1921.

Gages.—Staff, in three sections, installed on left bank at upstream side of bridge; lower section inclined, middle and upper sections vertical. Standard chain attached to upstream side of bridge installed to same datum as staff gage. Read by T. A. Lippincott and J. H. Brotzman.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and boulders. Control is at a well defined riffle about one-half mile below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 21.0 feet at 8 p. m. March 10 (discharge, 111,000 second-feet); minimum, 2.18 feet during several days in September (discharge, 1,790 second-feet).

1906-1921: Maximum stage recorded, 25.0 feet March 28, 1913 (discharge, 144,000 second-feet); minimum, 1.55 feet September 20, 1908 (discharge, 870 second-feet).

Ice.—Stage-discharge relation not seriously affected by ice.

Diversions.—The Delaware Division of the Pennsylvania Canal diverted about 230 second-feet from the Lehigh River near its mouth from October 1, to December 13 and from March 2 to September 30.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined. Gage read to half tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Cooperation.—Record furnished by United States Geological Survey Office, Trenton, N. J.

Discharge measurements of Delaware River at Riegelsville, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
28	Aug. 10	O. Lauterhahn	3.28	3,760
29	Sept. 21*	O. Lauterhahn	2.23	1,840

* Discharge measurement of flow in canal 230 second-feet, not included in discharge of river.

Daily Mean Gage Height, in feet, of Delaware River at Riegelsville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.20	4.65	7.15	5.30	4.34	7.43	7.85	7.20	3.89	3.68	3.69	2.28
2	11.78	4.36	------	5.15	3.90	8.55	8.85	8.70	3.79	3.23	3.28	2.23
3	9.9	4.57	------	5.45	4.00	9.50	8.60	8.35	3.59	3.18	3.43	2,23
4	7.4	6.40	------	5.83	3.95	12.65	7.72	7.82	3.54	3.08	3.94	2.28
5	7.03	6.7	------	5.55	3.95	11.90	7.27	8.40	3.64	2.98	3.54	2.23
6	6.43	5.87	------	5.30	4.22	10.00	6.83	8.00	3.38	2.83	3.38	2.18
7	6.43	5.2	------	5.15	4.83	9.35	6.47	7.57	3.38	2.73	3.18	2.55
8	5.4	4.95	------	5.03	4.42	11.75	6.15	7.10	3.33	2.63	3.38	2.45
9	5.07	4.8	------	5.05	4.60	14.55	6.13	6.43	3.23	2.53	3.33	2.33
10	4.77	4.63	------	4.70	4.55	18.30	6.10	6.05	3.13	2.73	3.28	2.31
11	4.57	4.50	6.93	4.53	4.42	17.10	5.77	5.57	3.03	3.03	3.33	2.23
12	4.34	4.50	6.6	4.49	4.57	12.80	5.53	5.45	2.98	3.33	3.15	2.21
13	4.09	4.19	6.2	4.19	4.19	11.50	5.23	5.55	3.03	3.59	2.98	2.21
14	4.14	4.02	6.6	4.63	4.19	11.30	5.07	6.20	2.93	3.23	2.98	2.21
15	------	3.96	------	6.43	4.19	10.65	5.00	5.95	2.83	3.23	3.13	2.23
16	------	3.84	------	7.30	4.14	9.85	5.30	5.60	2.83	3.74	2.98	2.31
17	------	4.29	------	6.90	4.22	9.50	5.25	5.20	2.78	3.74	2.88	2.31
18	3.89	4.75	------	5.45	4.65	9.00	7.17	4.90	2.83	3.79	2.78	2.23
19	3.89	6.63	------	4.29	5.10	8.55	7.75	4.65	2.78	3.48	2.78	2.21
20	3.76	6.15	7.00	4.24	------	7.80	7.37	4.39	2.73	6.33	2.73	2.18
21	3.66	5.73	6.37	4.6	4.10	7.43	6.77	4.29	2.68	4.44	2.73	2.23
22	3.51	5.47	6.27	5.15	4.20	7.23	6.33	4.19	2.58	4.19	2.75	3.03
23	3.41	6.30	6.83	5.50	4.80	6.97	5.95	4.06	2.53	4.24	2.65	2.98
24	3.35	------	7.0	5.73	4.60	6.70	8.00	4.09	2.53	3.74	2.53	3.35
25	3.33	------	7.23	5.35	4.00	7.88	8.90	4.04	2.48	3.49	2.58	3.18
26	3.15	------	6.35	------	3.90	9.10	8.20	4.19	2.58	3.23	2.51	2.93
27	3.13	------	5.85	------	4.30	9.30	7.40	4.39	2.63	3.13	2.45	2.78
28	3.72	------	5.63	4.04	5.97	------	6.95	4.24	2.53	2.98	2.43	2.65
29	3.94	6.90	5.4	4.09	------	8.10	6.50	4.09	2.83	2.93	2.38	2.53
30	4.70	6.53	5.15	4.32	------	7.48	6.37	3.94	3.38	2.93	2.33	2.55
31	4.70	------	5.45	4.67	------	6.95	------	3.84	------	3.08	2.33	------

NOTE—Gage height Oct. 15-17, Dec. 2-7, Jan. 26 and 27, Feb. 20 and Mar. 28 not observed; Nov. 24-28, Dec. 8-10 and 15-19 unsatisfactory.

Daily discharge, in second-feet, of Delaware River at Riegelsville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18,000	8,150	18,000	10,500	7,170	18,800	20,700	18,000	5,920	5,310	5,310	1,990
2	43,100	7,490	40,000	10,200	5,920	24,500	25,600	25,000	5,610	3,880	4,420	1,900
3	31,600	8,150	55,000	10,900	6,230	29,300	24,500	23,500	5,010	3,880	4,420	1,900
4	18,800	14,600	44,000	12,400	6,230	48,400	20,200	20,700	4,710	3,650	5,920	1,990
5	17,100	15,800	36,000	11,600	6,230	43,800	18,400	23,500	5,010	3,390	4,710	1,900
6	14,600	12,700	30,000	10,500	6,850	32,100	16,300	21,600	4,420	3,050	4,420	1,820
7	14,600	10,200	30,000	10,200	8,820	28,800	15,000	19,700	4,420	2,840	3,880	2,440
8	10,900	9,500	26,000	9,500	7,490	43,100	13,900	17,500	4,140	2,630	4,420	2,250
9	9,840	8,820	22,000	9,500	8,150	62,400	13,500	14,600	3,880	2,440	4,140	2,080
10	8,820	8,150	18,000	8,480	8,150	90,000	13,500	13,100	3,630	2,840	4,140	1,990
11	8,150	7,820	16,700	7,820	7,490	80,800	12,400	11,600	3,390	3,390	4,140	1,900
12	7,170	7,820	15,400	7,820	8,150	49,700	11,200	10,900	3,390	4,140	3,880	1,820
13	6,540	6,850	13,900	6,850	6,850	44,200	10,200	11,600	3,390	5,010	3,390	1,820
14	6,540	6,230	15,400	8,150	6,850	39,900	9,840	13,900	3,280	3,880	3,390	1,820
15	6,540	6,230	36,000	14,600	6,850	35,700	9,500	13,100	3,050	3,880	3,630	1,900
16	6,230	5,610	44,000	18,400	6,540	31,000	10,500	11,600	3,050	5,310	3,390	1,990
17	6,230	7,170	34,000	16,700	6,850	29,300	10,200	10,200	2,940	5,310	3,160	1,990
18	5,920	8,820	26,000	10,900	8,150	26,600	18,000	9,160	3,050	5,610	2,940	1,900
19	5,920	15,400	20,000	7,170	9,840	24,500	20,700	8,150	2,940	4,710	2,940	1,820
20	5,610	13,900	17,100	6,850	8,150	20,700	18,800	7,490	2,840	14,200	2,840	1,820
21	5,310	12,000	14,600	8,150	6,540	18,800	16,300	7,170	2,730	7,490	2,840	1,900
22	4,710	11,200	14,200	10,200	6,850	18,000	14,200	6,850	2,530	6,850	2,840	3,390
23	4,420	14,200	16,300	11,200	8,820	17,100	13,100	6,540	2,440	6,850	2,630	3,390
24	4,420	30,000	17,100	12,000	8,150	15,800	21,600	6,540	2,440	5,310	2,440	4,420
25	4,140	38,000	18,000	10,900	6,230	21,100	26,100	6,230	2,340	4,710	2,530	3,880
26	3,880	28,000	14,600	9,500	5,920	27,100	22,600	6,850	2,530	3,880	2,340	3,280
27	3,630	22,000	12,400	7,490	7,170	28,200	18,800	7,490	2,630	3,630	2,250	2,940
28	5,310	18,000	11,600	6,230	13,100	25,000	17,100	6,850	2,440	3,390	2,250	2,630
29	5,920	16,700	10,900	6,540	-------	22,100	15,000	6,540	3,050	3,280	2,160	2,440
30	8,480	15,000	10,200	7,170	-------	19,300	14,600	5,920	4,420	3,280	2,080	2,440
31	8,480	-------	10,900	8,480	-------	17,100	-------	5,610	-------	3,630	2,080	-------

NOTE—Discharge Oct. 15-17, Dec. 2-7, Jan. 26 and 27, Feb. 20 and Mar. 28 estimated, because of no gage height record; Nov. 24-28, Dec. 8-10 and 15-19 estimated, because of unsatisfactory gage height record. Discharge does not include water diverted past the gage through the Delaware Division of the Pennsylvania Canal. Canal was closed Dec. 14 to Mar. 1.

Monthly discharge of Delaware River at Riegelsville, for the year ending Sept. 30, 1921

(Drainage area 6,430 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	43,100	3,630	10,000	1.60	1.84
November	38,000	5,610	13,200	2.08	2.32
December	55,000	10,200	22,800	3.56	4.10
January	18,400	6,230	9,900	1.54	1.78
February	13,100	5,920	7,490	1.16	1.21
March	90,000	15,800	33,300	5.21	6.01
April	26,100	9,500	16,400	2.58	2.88
May	25,000	5,610	12,200	1.93	2.22
June	5,920	2,340	3,520	.583	.65
July	14,200	2,440	4,570	.746	.86
August	5,920	2,080	3,420	.568	.65
September	4,420	1,820	2,320	.398	.44
The Year	90,000	1,820	11,700	1.84	24.96

NOTE—Discharge does not include the water diverted past the gage through the Delaware Division of the Pennsylvania Canal. Canal was closed Dec. 14 to Mar. 1. Run-off includes 230 second-feet, estimated flow in canal, Oct. 1 to Dec. 13 and Mar. 2 to Sept. 30.

DELAWARE BASIN—STATION NO. 11

LITTLE SCHUYLKILL RIVER AT TAMAQUA

Location.—At three-span stone arch highway bridge, Broad Street, Tamaqua, Schuylkill County, about 500 feet upstream from the mouth of Panther Creek.

Drainage Area.—44 square miles.

Records Available.—June 23, 1916, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by W. P. Griffiths.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Section is entirely walled in above and below the bridge. Banks subject to overflow only during extreme floods. Bed is composed of gravel and rocks. Low-water control is a gravel bar extending diagonally across the channel at downstream side of bridge. Stage-discharge relation not permanent, owing to changes in the gravel bar and lodging of debris and waste on the control.

Extremes of Discharge.—Maximum open-water stage during the year, 3.85 feet observed at 5 p. m. March 3 (discharge, 902 second-feet); a stage of 3.85 feet was also observed at 5 p. m. February 21, but the water was held back by an ice jam; minimum, 1.85 feet several days in September (discharge, 8.8 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation subject to change owing to shifts in control and probability of debris and waste collecting on control; also affected by ice. Rating curve well defined below 25 second-feet and fairly well defined between 25 and 300 second-feet Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Little Schuylkill River at Tamaqua, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
21	May 12*	H. J. McIntyre	2.46	98.8
22	12*	H. J. McIntyre	2.48	94.3
23	Aug. 9†	H. L. Landis	2.16	41.8

* Measurement made by wading 50 feet above gage.
† Measurement made by wading 150 feet above gage.

Daily Mean Gage Height, in feet, of Little Schuylkill River at Tamaqua, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.18	2.00	2.90	2.40	2.25	2.72	2.72	2.60	2.18	2.06	2.08	1.95
2	2.95	2.05	2.84	2.40	2.22	3.05	2.65	2.52	2.15	2.00	2.20	1.95
3	2.75	2.10	2.74	2.40	2.20	3.68	2.60	2.50	2.15	1.99	2.48	1.95
4	2.62	2.14	2.65	2.35	2.15	3.55	2.55	2.52	2.16	1.95	2.44	1.90
5	2.53	2.15	2.60	2.35	2.18	3.30	2.53	2.75	2.15	1.92	2.22	1.90
6	2.42	2.15	2.60	2.34	2.22	3.09	2.50	2.70	2.15	1.91	2.10	1.92
7	2.40	2.11	2.60	2.33	2.25	2.84	2.48	2.70	2.15	1.90	2.08	1.88
8	2.34	2.10	2.50	2.30	2.22	2.80	2.45	2.65	2.12	1.90	2.26	1.85
9	2.30	2.13	2.48	2.29	2.20	2.90	2.45	2.60	2.10	1.90	2.13	1.85
10	2.25	2.11	2.49	2.25	2.18	2.80	2.40	2.50	2.10	2.00	2.10	1.85
11	2.20	2.10	2.50	2.26	2.20	2.82	2.35	2.50	2.10	2.05	2.10	1.85
12	2.28	2.10	2.45	2.27	2.22	2.79	2.32	2.46	2.05	2.01	2.10	2.15
13	2.18	2.10	2.40	2.27	2.25	2.75	2.30	2.75	2.05	2.00	2.10	1.94
14	2.17	2.10	3.00	2.86	2.24	2.70	2.40	2.68	2.05	1.89	2.08	1.90
15	2.17	2.10	3.28	2.55	2.28	2.70	2.46	2.60	2.05	2.00	2.08	1.90
16	2.16	2.10	2.88	2.35	2.30	2.70	2.42	2.60	2.00	2.00	2.06	1.87
17	2.12	2.68	2.80	2.26	2.30	2.60	2.35	2.55	2.00	1.90	2.04	1.94
18	2.09	2.58	2.70	2.78	2.24	2.60	2.35	2.50	2.00	1.90	2.10	1.92
19	2.07	2.48	2.60	3.15	2.25	2.55	2.33	2.45	2.00	2.32	2.05	1.85
20	2.07	2.44	2.55	3.05	2.98	2.52	2.33	2.40	2.00	2.78	2.05	1.85
21	2.05	2.40	2.45	3.00	3.84	2.50	2.32	2.40	1.98	2.55	2.05	2.28
22	2.05	2.40	2.45	2.54	3.42	2.45	2.32	2.40	1.96	2.32	2.05	2.22
23	2.00	2.80	2.78	2.41	2.45	2.44	3.16	2.40	1.96	2.28	2.05	2.08
24	2.00	2.62	2.70	2.42	2.20	2.46	3.08	2.34	1.95	2.25	2.00	2.00
25	2.00	2.55	2.62	3.16	2.38	3.25	2.85	2.34	1.95	2.20	2.00	2.12
26	2.00	2.59	2.60	3.12	2.35	3.02	2.72	2.29	1.95	2.15	1.98	1.99
27	2.02	2.54	2.59	3.05	2.42	2.90	2.60	2.25	1.95	2.14	1.95	1.89
28	2.28	2.50	2.57	2.92	2.57	2.85	2.55	2.25	1.95	2.10	1.95	1.88
29	2.12	2.45	2.54	2.62	------	2.74	2.50	2.25	2.15	2.15	1.95	1.88
30	2.00	2.45	2.44	2.52	------	2.68	2.62	2.20	2.14	2.15	1.95	1.88
31	2.00	------	2.40	2.46	------	2.65	------	2.20	------	2.10	1.95	------

NOTE—Stage-discharge relation Jan. 18-20, 24-29 and Feb. 20-22 affected by ice.

Daily discharge, in second-feet, of Little Schuylkill River at Tamaqua, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	460	24	300	115	72	220	220	180	56	34	37	17
2	325	32	280	115	65	375	200	145	50	24	60	17
3	240	40	240	115	60	790	180	145	50	22	139	17
4	180	48	200	100	50	685	162	145	52	17	127	12
5	162	50	180	100	56	520	162	240	50	14	65	12
6	121	50	180	97	65	400	145	220	50	13	40	14
7	115	42	180	94	72	280	139	220	50	12	37	11
8	97	40	145	85	65	260	130	200	44	12	75	8.8
9	85	46	139	82	60	300	130	180	40	12	46	8.8
10	72	42	142	72	56	260	115	145	40	24	40	8.8
11	60	40	145	75	60	260	100	145	40	32	40	8.8
12	80	40	130	78	65	260	91	133	32	26	40	50
13	56	40	115	78	72	240	85	240	32	24	40	16
14	54	40	350	280	70	220	115	220	32	11	37	12
15	54	40	520	162	80	220	133	180	32	24	37	12
16	52	40	300	100	85	220	121	180	24	24	34	10
17	44	220	260	75	85	180	100	162	24	12	30	16
18	38	180	220	60	70	180	100	145	24	12	40	14
19	35	139	180	60	72	162	94	130	24	91	32	8.8
20	35	127	162	200	110	145	94	115	24	260	32	8.8
21	32	115	130	350	260	145	91	115	21	162	32	80
22	32	115	130	162	220	130	91	115	18	91	32	65
23	24	260	260	118	130	127	430	115	18	80	32	37
24	24	180	220	85	60	133	400	97	17	72	24	24
25	24	162	180	60	109	490	280	97	17	60	24	44
26	24	180	180	50	100	350	220	82	17	50	21	22
27	27	162	180	50	121	300	180	72	17	48	17	11
28	80	145	162	60	162	280	162	72	17	40	17	11
29	44	130	162	85	------	240	145	72	50	50	17	11
30	24	130	127	145	------	220	180	60	48	50	17	11
31	24	------	115	133	------	200	------	60	------	40	17	------

NOTE—Discharge does not include the quantity of water diverted by the Panther Valley Water Co. Discharge Jan. 18-20, 24-29 and Feb. 20-22 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Little Swatara Creek near Pine Grove.

Monthly discharge of Little Schuylkill River at Tamaqua, for the year ending Sept. 30, 1921

(Drainage area 44 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	460	24	87.9	2.03	2.34
November	260	24	96.6	2.22	2.48
December	520	115	200	4.57	5.27
January	350	50	111	2.52	2.90
February	260	50	91.1	2.12	2.21
March	790	127	284	6.48	7.47
April	430	85	160	3.66	4.08
May	240	60	143	3.27	3.77
June	56	17	33.7	.805	.90
July	260	11	46.5	1.10	1.27
August	139	17	41.2	.968	1.12
September	80	8.8	20.0	.500	.56
The year	790	8.8	110	2.55	34.37

NOTE—Discharge does not include the quantity of water diverted by the Panther Valley Water Company. Run-off does include the quantity of water diverted.

DELAWARE BASIN—STATION NO. 12

SCHUYLKILL RIVER AT READING

Location.—At concrete viaduct, Penn St., Reading, Berks County.

Drainage Area.—900 square miles.

Records Available.—May 6, 1914, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by H. J. Kline. Elevation of gage zero 188.50 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Right bank is high and not subject to overflow; left is low and stream begins to overflow the canal tow-path at a stage of 6.8 feet. Bed is composed of gravel. Low-water control is at a slight riffle about 700 feet below gage; may shift occasionally. Control for high stages is probably at the Pennsylvania Railroad bridge about 900 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 6.6 feet at 10 a. m. May 5 (discharge, 11,900 second-feet); minimum,—0.64 foot on September 5, 6 and at 5.30 p. m. September 10 (discharge, 188 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Diversions.—During navigation season water is diverted past the gage through the Schuylkill Navigation Company Canal, which follows along the left bank.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined below 15,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good, except for low stages, which are only fair, owing to uncertain quantity of water diverted by canal.

Discharge Measurements of Schuylkill River at Reading, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
44	Oct. 16	Metropolitan Edison Co.	—0.12	459
45	Apr. 27	H. J. McIntyre	2.10	2,250
46	Aug. 9*	H. L. Landis	.44	744

*Measurements also made of discharge in canal, 63.6 sec. ft.

Daily Mean Gage Height, in feet, of Schuylkill River at Reading, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.58	—.25	2.66	1.02	1.14	4.27	2.07	1.95	0.35	0.28	—0.18	—0.58
2	2.40	—.28	3.98	.95	.68	4.35	1.77	1.92	.25	.20	.02	—.60
3	1.70	.28	3.15	1.06	.65	4.79	1.58	1.64	.20	.12	.97	—.59
4	1.30	.30	2.58	.95	.63	4.66	1.47	1.70	.44	—.05	1.15	—.62
5	1.00	.00	2.35	.79	.59	3.98	1.37	5.72	.30	—.14	.45	—.64
6	.72	—.10	2.21	.71	1.09	3.47	1.17	4.79	.12	—.25	.07	—.64
7	.60	—.12	1.75	.59	1.39	3.05	.93	3.88	.12	—.25	.15	—.32
8	.52	—.04	1.50	.68	.79	2.69	.87	3.18	.12	—.34	.91	—.36
9	.35	—.08	1.38	.69	.79	2.62	1.24	2.61	.12	—.34	.53	—.52
10	.28	—.12	1.28	.57	.87	3.35	1.02	2.22	.10	—.08	.09	—.62
11	.20	—.12	1.18	.46	1.32	2.75	.82	1.92	.04	.13	—.03	—.26
12	.18	—.29	1.02	.42	1.41	2.51	.72	1.63	.12	.75	—.05	—.38
13	.12	—.12	.95	.33	1.17	2.72	.64	3.66	.02	.78	—.08	—.52
14	.21	—.25	2.07	.63	1.05	2.25	.58	3.02	.00	.26	—.21	—.59
15	.02	—.26	3.58	3.26	1.09	2.02	.92	2.48	—.22	.15	—.19	—.59
16	—.02	—.08	2.97	2.17	.92	1.97	1.51	2.16	—.16	.14	—.25	—.59
17	—.01	2.04	2.39	1.67	.88	1.73	1.08	1.83	—.10	.01	—.18	—.56
18	—.10	1.95	2.02	1.12	.82	1.65	1.02	1.60	—.12	—.12	—.31	—.53
19	—.10	1.41	1.66	.77	.73	1.47	.98	1.42	—.18	—.14	—.29	—.38
20	—.12	1.18	1.39	.82	.55	1.35	.85	.95	—.19	3.96	—.23	—.56
21	—.21	.95	.97	1.06	.51	1.29	.68	1.20	—.25	2.00	—.35	—.21
22	—.20	.78	1.07	1.78	.99	1.22	.72	1.01	—.39	1.10	—.39	1.24
23	—.26	1.22	2.64	1.76	.99	.96	1.62	1.00	—.44	.90	—.41	.46
24	—.22	1.52	2.27	1.25	.98	.98	3.75	.85	—.36	.62	—.43	—.06
25	—.20	1.40	1.95	.14	.68	2.42	3.05	.34	—.36	.37	—.47	—.18
26	—.25	1.34	1.72	.69	.66	2.65	2.50	.78	—.24	.19	—.47	—.05
27	—.26	1.18	1.69	.54	.94	2.28	2.12	.60	—.15	.09	—.48	—.21
28	—.02	1.12	1.72	.53	2.89	2.02	1.88	.50	—.21	.02	—.53	—.22
29	.14	.98	1.47	.51	------	1.87	1.70	.86	.26	.07	—.54	—.36
30	—.12	.79	1.21	.73	------	1.65	1.65	.80	.68	.08	—.53	—.43
31	—.36	------	.96	1.56	------	1.47	------	.54	------	—.05	—.58	------

Daily discharge, in second-feet, of Schuylkill River at Reading, for year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,040	410	3,240	1,180	1,260	6,540	2,250	2,100	630	600	350	206
2	2,760	390	5,880	1,180	950	6,760	1,840	1,970	570	540	440	200
3	1,800	690	4,200	1,260	880	7,660	1,610	1,610	540	490	1,080	203
4	1,420	690	3,070	1,180	880	7,430	1,510	1,720	690	415	1,240	194
5	1,180	530	2,760	1,020	880	5,880	1,420	9,780	600	370	690	188
6	950	480	2,460	950	1,260	4,830	1,240	7,660	490	330	465	188
7	880	480	1,920	880	1,500	3,800	1,000	5,670	490	330	515	310
8	810	505	1.590	950	1,020	3,200	1,000	4,200	490	290	1,000	290
9	720	480	1,500	950	1,020	3.020	1,240	3,020	490	290	720	224
10	690	480	1,420	880	1,100	4,620	1,080	2,400	490	390	490	194
11	630	480	1,340	780	1,420	3,400	930	1,970	465	515	415	330
12	630	310	1,180	750	1,500	2,860	860	1,610	490	930	415	270
13	580	480	1,180	720	1,340	3,200	790	5,250	440	930	390	224
14	630	410	2,320	880	1,180	2,400	790	3,800	440	570	350	203
15	530	410	5,040	4,410	1,260	2,100	1,000	2,860	250	515	350	203
16	530	480	3,800	2,460	1,100	2,100	1,510	2,400	370	515	330	203
17	530	2,180	2,760	1,800	1,100	1,720	1,160	1,840	390	440	350	212
18	480	2,180	2,180	1,260	1,020	1,610	1,080	1,610	390	390	310	221
19	480	1,500	1,800	1,020	950	1,510	1,080	1,420	350	370	310	270
20	480	1,340	1,500	1,020	880	1,420	930	1,080	350	5,880	330	212
21	430	1,180	1,180	1,260	810	1,330	860	1,240	330	2,100	290	350
22	430	1,020	1,260	1,920	1,180	1,240	860	1,080	270	1,160	270	1,240
23	410	1,340	3,070	1,920	1,180	1,080	1,610	1,080	250	1,000	270	690
24	430	1,590	2,610	1,340	1,180	1,080	5,460	930	290	790	250	415
25	430	1,500	2,180	605	950	2,700	3,800	630	290	630	250	350
26	410	1,420	1,800	950	950	3,020	2,860	930	330	540	250	415
27	410	1,340	1,800	810	1,100	2,550	2,250	790	370	490	230	350
28	530	1,260	1,800	810	3,600	2,100	1,970	720	350	440	221	350
29	605	1,180	1,590	810	-------	1,970	1,720	1,000	570	465	218	290
30	480	1,020	1,340	950	-------	1,610	1,610	930	860	490	221	250
31	370	-------	1,180	1,690	-------	1,510	-------	720	-------	415	206	-------

NOTE—Discharge does not include water diverted past the gage through Schuylkill Navigation Company Canal. Canal was closed Dec. 12 to May 31.

Monthly discharge of Schuylkill River at Reading, for the year ending Sept. 30, 1921

(Drainage area 900 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	5,040	370	861	0.957	1.10
November	2,180	310	925	1.03	1.15
December	5,880	1,180	2,290	2.54	2.93
January	4,410	605	1,240	1.38	1.59
February	3,600	810	1,190	1.32	1.38
March	7,660	1,080	3,100	3.44	3.97
April	5,460	790	1,580	1.76	1.96
May	9,780	630	2,390	2.66	3.07
June	860	250	448	.498	.56
July	5,880	290	762	.847	.98
August	1,240	206	426	.473	.55
September	1,240	188	308	.342	.38
The year	9,780	188	1,300	1.44	19.62

NOTE—Discharge and run-off does not include the water diverted past the gage through Schuylkill Navigation Company Canal. Canal was closed Dec. 12 to May 31.

PERKIOMEN CREEK AT GRATERS FORD

Location.—At two-span steel highway bridge, Grater's Ford, Montgomery County.

Drainage Area.—280 square miles.

Records Available.—June 11, 1914, to September 30, 1921.

Gages.—Standard chain attached to upstream side of bridge and inclined staff installed in August on left bank 1700 feet upstream from the chain gage. Both gages are read to hundredths twice daily by C. K. Kulp. The elevation of the staff gage zero is 3.23 feet above that of the chain gage.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and rock. Low stages at the chain gage are affected by backwater from the dam at Ironbridge. Control for low stages at the staff gage is at a riffle about 200 feet below the gage, where the bed is composed of gravel and large stones; probably permanent. Control for medium and high stages, for both gages, is the dam at Ironbridge.

Extremes of Stage.—Maximum gage height during the year, estimated from hydrograph, 8.4 feet at chain gage, 8 p. m. December 1; minimum, 1.33 feet at chain gage, 6 p. m. August 30.

Ice.—Stage-discharge relation usually affected by ice.

Discharge measurements of Perkiomen Creek at Graters Ford, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
38	May 3	H. J. McIntyre	3.52	281
39	Aug. 15*	H. L. Landis	2.92	60.6
40	Sept. 7†	H. J. McIntyre	2.44	41.4

* Measurements made by wading about 3,200 feet above gage.
† Measurement made by wading about 1,730 feet above gage.

Daily Mean Chain Gage Height, in feet, of Perkiomen Creek at Graters Ford, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.70	2.38	5.96	3.26	3.58	6.75	3.68	3.64	2.84	3.93	2.30	2.06
2	2.54	2.44	7.37	3.27	3.55	5.52	3.59	3.50	2.77	3.91	2.46	1.96
3	2.52	2.48	5.83	3.28	3.50	4.92	3.55	3.58	2.74	3.52	4.01	1.74
4	2.44	2.46	4.45	3.31	3.47	4.92	3.52	4.88	2.95	3.32	3.45	2.00
5	2.38	2.54	3.55	3.35	3.52	4.94	3.49	5.10	2.86	3.10	2.94	1.98
6	2.47	2.49	3.36	3.42	3.50	4.77	3.42	4.48	2.78	2.94	2.82	2.05
7	2.46	2.50	3.25	3.42	3.47	4.59	3.44	3.99	2.79	2.71	2.72	2.30
8	2.48	2.46	3.20	3.52	3.46	4.49	3.41	3.82	2.68	2.58	3.42	2.26
9	2.54	2.60	3.13	3.50	3.50	4.72	3.62	3.68	2.76	2.49	3.28	2.52
10	2.64	2.64	3.13	3.50	3.56	4.74	3.60	3.61	2.68	2.74	2.97	2.24
11	2.65	2.67	3.09	3.52	4.34	4.39	3.55	3.52	2.94	3.58	2.87	2.12
12	2.91	2.66	2.97	3.48	4.35	4.16	3.40	3.62	2.93	3.26	2.84	2.39
13	2.80	2.79	2.90	3.50	3.90	4.15	3.32	3.51	2.82	3.27	2.97	2.35
14	2.74	2.84	3.04	5.47	3.67	3.97	3.22	3.45	2.72	3.24	3.03	2.18
15	2.52	2.88	3.07	5.40	3.58	3.77	3.28	3.52	2.64	3.15	3.01	2.55
16	2.51	3.12	2.97	3.98	3.58	3.62	3.47	3.46	2.64	3.07	2.68	2.42
17	2.50	5.21	2.93	3.68	3.58	3.52	4.22	3.40	2.52	3.06	2.94	2.54
18	2.42	4.25	2.92	3.45	3.52	3.53	4.29	3.34	2.41	3.04	2.84	2.69
19	2.40	3.84	2.85	3.50	3.56	3.50	4.03	3.28	2.35	2.94	2.60	2.37
20	2.38	3.62	2.84	3.43	3.66	3.44	3.82	3.22	2.19	2.92	2.60	2.50
21	2.34	3.48	2.80	3.52	3.82	3.49	3.63	3.24	2.15	2.90	2.60	2.72
22	2.42	4.14	2.88	3.56	3.96	3.28	3.60	3.24	2.04	2.82	2.56	2.88
23	2.28	6.74	2.78	3.71	3.90	3.25	4.19	3.18	2.06	2.76	2.38	3.24
24	2.42	5.73	2.77	3.67	3.72	3.22	4.25	3.13	2.05	2.74	2.12	3.15
25	2.34	4.09	2.82	3.63	3.62	3.21	3.90	3.12	1.98	2.66	2.02	3.03
26	2.44	4.63	3.01	3.54	3.50	3.25	3.60	3.00	2.06	2.65	1.93	2.71
27	2.48	3.80	3.14	3.51	4.62	3.29	3.38	3.05	2.12	2.58	1.54	2.50
28	2.36	3.43	3.18	3.54	8.10	3.20	3.32	3.01	2.10	2.50	1.56	2.60
29	2.40	3.29	3.12	3.51		3.18	3.26	3.05	2.19	2.42	1.24	2.82
30	2.48	3.20	3.23	3.55		3.19	3.49	3.06	3.34	2.40	1.34	2.68
31	2.40		3.22	3.52		3.35		2.95		2.37	1.54	

Daily Mean Staff Gage Height, in feet, of Perkiomen Creek at Graters Ford, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2												
3												
4												
5												
6												
7												1.24
8												1.14
9												1.20
10												1.19
11												1.20
12												1.19
13												1.24
14												1.28
15												1.32
16												1.30
17												1.20
18												1.16
19												1.14
20												1.08
21												1.17
22												1.62
23												1.57
24												1.52
25												1.44
26												1.36
27												1.32
28												1.36
29												1.32
30												1.29
31												

DELAWARE BASIN—STATION NO. 14

BRANDYWINE CREEK AT CHADDS FORD

Location.—At two-span steel railroad bridge, Pennsylvania Railroad, Chadd's Ford, Delaware County.

Drainage Area.—285 square miles.

Records Available.—August 1, 1911, to September 30, 1921.

Gages.—Standard chain attached to upstream side of bridge; read by H. W. Guest. Elevation of gage zero 150.18 feet, United States Geological Survey datum. The Sanborn water-stage recorder, installed on the upstream end of pier, is referred to the chain gage datum.

Discharge Measurements.—Made from upstream side of bridge.

Channel and Control.—The right bank is low and the stream begins to overflow a flat 700 feet wide at a stage of about 6 feet. Left bank is high and not subject to overflow. Bed is composed of mud, gravel and stones. Control is at the first of a series of low riffles, where the bed is composed of gravel, extending downstream from about 150 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 6.0 feet at 1 p. m. December 1 (discharge, 2,660 second-feet); minimum, 0.48 foot at 6 p. m. September 3 and 10 (discharge, 69 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Regulation.—Fluctuations in stage during low water are caused by the operation of a mill above the station.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined between 100 and 2,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height, computed from chain gage readings, to rating table. Results good.

Discharge Measurements of Brandywine Creek at Chadds Ford, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
34	May 3	H. J. McIntyre	1.59	299
35	Aug. 17	H. J. McIntyre	1.11	143
36	Sept. 8	H. J. McIntyre	.96	104

Daily Mean Gage Height, in feet, of Brandywine Creek at Chadds Ford, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.80	1.12	3.77	1.50	1.52	3.49	2.13	1.82	1.49	2.47	1.01	0.74
2	1.52	1.12	2.80	1.58	1.48	2.92	1.79	1.83	1.40	1.91	1.09	.72
3	1.48	1.48	1.82	1.56	1.58	2.64	1.68	1.60	1.39	1.71	1.42	.60
4	1.45	1.24	1.66	1.50	1.62	2.55	1.62	3.07	1.36	1.62	1.42	.81
5	1.41	1.22	1.66	1.46	1.64	2.37	1.61	4.53	1.35	1.27	1.20	.78
6	1.36	1.20	1.76	1.45	1.59	2.06	1.61	2.64	1.35	1.20	1.11	.80
7	1.32	1.20	1.52	1.46	1.58	1.94	1.63	2.26	1.32	1.19	1.16	.94
8	1.26	1.20	1.44	1.51	1.62	1.81	1.62	2.08	1.30	1.18	2.18	.96
9	1.20	1.19	1.41	1.48	1.59	1.79	1.76	1.86	1.31	1.14	1.42	.85
10	1.20	1.18	1.40	1.48	1.61	3.23	1.78	1.79	1.29	1.14	1.14	.67
11	1.20	1.16	1.40	1.48	1.59	2.18	1.84	1.70	1.29	1.26	1.09	.85
12	1.19	1.12	1.40	1.51	1.60	2.10	1.81	1.68	1.29	1.31	1.04	.94
13	1.18	1.10	1.42	1.48	1.59	2.09	1.68	2.89	1.42	1.25	1.04	.93
14	1.18	1.10	2.05	3.11	1.52	2.01	1.62	2.16	1.34	1.21	1.02	.92
15	1.16	1.10	2.45	4.23	1.54	1.94	1.61	1.99	1.30	1.18	1.12	.90
16	1.14	1.24	1.75	2.79	1.51	1.80	1.60	1.79	1.30	1.36	1.04	.86
17	1.12	3.56	1.66	2.41	1.52	1.81	1.60	1.70	1.29	1.26	1.06	.87
18	1.11	2.09	1.58	1.91	1.49	1.79	1.58	1.65	1.28	1.18	1.22	.91
19	1.12	1.48	1.48	1.63	1.46	1.78	-------	1.62	1.27	1.11	1.14	.90
20	1.11	1.29	1.44	1.60	1.46	1.74	-------	1.59	1.22	1.16	1.05	.99
21	1.10	1.25	1.40	1.59	1.39	1.71	-------	1.56	1.18	1.14	1.04	.97
22	1.12	1.25	1.62	1.86	1.21	1.69	-------	1.55	1.14	1.11	1.03	1.22
23	1.12	1.78	2.50	1.80	1.48	1.65	-------	1.55	1.13	1.14	.98	.99
24	1.11	1.58	1.84	1.76	1.59	1.64	-------	1.50	1.15	1.14	.99	.97
25	1.12	1.42	1.70	1.12	1.60	1.67	1.77	1.52	1.15	1.08	.96	.98
26	1.12	1.31	1.65	1.59	1.64	1.66	1.60	1.56	1.15	1.05	.76	1.02
27	1.12	1.26	1.61	1.58	1.96	1.66	1.58	1.51	1.21	1.04	.76	.98
28	1.14	1.30	1.54	1.62	3.42	1.66	1.53	1.50	1.18	1.04	.89	.96
29	1.13	1.31	1.50	1.65	-------	1.69	1.52	1.48	1.18	1.05	.92	1.01
30	1.14	1.30	1.50	1.60	-------	1.68	1.58	1.58	2.56	1.02	.98	.96
31	1.14	-------	1.49	1.60	-------	1.68	-------	1.51	-------	1.02	.83	-------

NOTE—Gage height Jan. 25 affected by ice jam above the gage and Apr. 19-24 not observed.

Daily discharge, in second-feet, of Brandywine Creek at Chadds Ford, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	380	145	1,310	269	269	1,160	521	380	266	657	116	76
2	269	145	821	305	262	868	380	400	234	419	136	74
3	262	262	380	287	305	727	342	305	231	342	241	70
4	252	181	324	269	305	727	305	962	220	305	241	81
5	238	174	324	255	324	611	305	1,690	217	174	168	79
6	220	168	361	252	305	480	305	727	217	168	151	80
7	207	168	269	255	305	439	324	542	207	165	156	102
8	187	168	248	269	305	380	305	500	200	162	512	106
9	168	165	238	262	305	380	361	400	203	151	241	87
10	168	162	234	262	305	1,010	380	380	197	151	151	72
11	168	156	234	262	305	542	400	342	197	187	136	87
12	165	145	234	269	305	500	380	342	197	203	124	102
13	162	139	241	262	305	500	342	821	241	184	124	100
14	162	139	480	962	269	459	305	521	214	171	119	98
15	156	139	657	1,530	287	439	305	459	200	162	145	94
16	151	181	361	821	269	380	305	380	200	220	124	88
17	145	1,210	324	634	269	380	305	342	197	187	129	90
18	142	500	305	419	266	380	305	324	194	162	174	96
19	145	262	262	324	255	380	287	305	190	142	151	94
20	142	197	248	305	255	361	287	305	174	156	126	112
21	139	184	234	305	231	342	269	287	162	151	124	108
22	145	184	305	400	171	342	269	287	151	142	122	174
23	145	380	680	380	262	324	380	287	148	151	119	112
24	142	305	400	361	305	324	634	269	154	151	112	108
25	145	241	342	145	305	324	361	269	154	134	106	110
26	145	203	324	305	324	324	305	287	154	126	77	119
27	145	187	305	305	439	324	305	269	171	124	77	110
28	151	200	287	305	1,110	324	287	269	162	124	93	106
29	148	203	269	324	-------	342	269	262	162	126	98	116
30	151	200	269	305	-------	342	305	305	727	119	110	106
31	151	-------	266	305	-------	342	-------	269	-------	119	84	-------

NOTE—Discharge Jan. 25 affected by ice jam above the gage which held back temporarily a part of the stream flow. Discharge Apr. 19-24 estimated, because of no gage height record, from weather records, study of gage height graph and discharge of Bushkill and McMichaels creeks near Shoemakers and Stroudsburg.

Monthly discharge of Brandwine Creek at Chadds Ford, for the year ending Sept. 30, 1921

(Drainage area 285 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	380	139	177	0.621	0.72
November	1,210	139	236	.828	.92
December	1,310	234	372	1.31	1.51
January	1,530	145	384	1.35	1.56
February	1,110	171	319	1.12	1.17
March	1,160	324	476	1.67	1.92
April	634	269	338	1.19	1.33
May	1,690	262	435	1.53	1.76
June	727	148	211	.740	.83
July	657	119	191	.670	.77
August	542	77	149	.523	.60
September	174	70	98.6	.346	.39
The year	1,690	70	283	.993	13.48

SUSQUEHANNA BASIN

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SUSQUEHANNA BASIN—STATION NO. 1

NORTH BRANCH SUSQUEHANNA RIVER AT BINGHAMTON, N. Y.

Location.—At four-span steel highway bridge, Washington Street, Binghampton, Broome County.

Drainage Area.—2,400 square miles.

Records Available.—July 31, 1901, to December 31, 1912, and January 23, 1915, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read to hundredths twice daily by A. L. Coleman; during high stages more frequently. Elevation of gage zero 821.49 feet, United States Geological Survey datum.

Discharge Measurements.—Owing to the stage-discharge relation being affected by backwater from the Chenango River, measurements were discontinued in 1912.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of fine and coarse gravel.

Extremes of Stage.—Maximum gage height during the year, 12.00 feet observed at 8 a. m. March 10; minimum, 1.80 feet at 5 p. m. June 23 and on June 27.

Ice.—Stage-discharge relation usually affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

Daily Mean Gage Height, in feet, of North Branch Susquehanna River at Binghamton, N. Y., for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.62	2.72	5.83	3.25	3.25	4.80	4.88	4.40	2.35	1.98	2.75	2.12
2	8.96	2.65	8.92	3.43	3.05	5.48	4.45	5.70	2.30	2.00	2.65	2.10
3	7.65	2.92	10.38	4.27	2.85	8.18	5.10	5.12	2.22	1.98	2.52	2.55
4	5.42	3.20	8.63	4.60	2.96	9.57	4.50	4.42	2.16	2.00	2.45	2.45
5	4.48	3.18	8.00	4.12	2.50	7.00	4.08	4.10	2.20	2.02	2.35	2.30
6	4.18	3.02	8.18	4.30	2.80	5.79	3.88	4.72	2.28	2.02	2.30	2.28
7	3.94	3.00	8.28	4.10	3.00	8.84	3.68	4.35	2.22	2.00	2.20	2.29
8	3.58	2.88	6.88	3.72	3.10	9.98	3.45	3.50	2.20	1.94	2.12	2.21
9	3.38	2.80	5.80	3.60	3.10	10.52	3.48	3.52	2.18	1.90	2.18	2.15
10	3.30	2.80	5.02	3.26	2.70	11.38	3.50	3.30	2.09	2.00	2.20	2.12
11	3.18	2.85	4.72	3.14	2.70	9.25	3.50	3.05	2.05	2.10	2.30	2.10
12	3.10	2.85	4.50	3.15	2.65	7.20	3.25	2.95	2.10	2.26	2.38	2.00
13	2.95	2.80	4.22	3.00	2.60	7.15	3.10	2.95	2.10	2.32	2.46	2.00
14	2.90	2.80	5.77	3.01	2.72	7.28	3.00	2.95	2.10	2.20	2.40	2.00
15	2.85	2.70	9.39	3.56	2.80	6.35	2.98	2.90	2.05	2.21	2.65	2.02
16	2.90	2.70	8.56	3.40	2.45	6.02	2.99	2.85	2.05	3.90	2.45	2.12
17	2.85	3.40	6.90	3.40	3.80	6.15	3.00	2.72	2.08	3.94	2.40	2.02
18	2.78	4.54	5.42	3.28	5.47	5.95	3.22	2.79	2.10	3.05	2.48	2.10
19	2.70	3.90	4.80	3.22	4.81	5.30	3.82	2.60	2.10	2.75	2.34	2.08
20	2.75	3.55	4.48	3.40	3.80	4.90	3.85	2.48	2.00	2.62	2.75	2.10
21	2.68	3.50	4.08	3.00	3.25	5.25	3.65	2.45	1.92	3.10	2.60	2.15
22	2.60	3.48	4.02	3.25	3.15	5.55	3.28	2.40	1.85	2.92	2.48	2.15
23	2.55	6.12	4.44	3.60	3.02	5.00	3.97	2.32	1.82	2.92	2.40	2.20
24	2.50	8.72	4.98	3.95	3.05	4.40	5.62	2.32	1.90	2.70	2.41	2.22
25	2.45	7.47	4.50	3.55	3.25	4.48	5.62	2.40	1.90	2.45	2.40	2.20
26	2.45	5.78	3.90	3.42	2.88	4.78	4.65	2.50	1.85	2.32	2.30	2.10
27	2.50	5.10	3.35	3.35	2.85	5.15	3.92	2.55	1.80	2.25	2.21	2.10
28	2.52	4.80	3.50	3.46	3.28	5.05	3.58	2.52	1.88	2.20	2.20	2.00
29	2.90	4.60	3.50	3.22	------	4.72	3.35	2.50	2.02	2.32	2.08	2.00
30	3.22	4.55	3.40	3.00	------	4.47	3.38	2.50	2.00	3.41	2.12	2.05
31	2.95	------	3.50	2.92	------	4.15	------	2.40	------	3.00	2.15	------

NOTE—Stage-discharge relation Jan. 15 to Feb. 17 affected by ice.

NORTH BRANCH SUSQUEHANNA RIVER AT VESTAL, N. Y.

Location.—At three-span steel highway bridge between Union and Vestal, Broome County.

Drainage Area.—3,730 square miles.

Records Available.—November 13, 1918, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read to half tenths twice daily by Fred A. Michelbach; during high stages more frequently. Elevation of gage zero 800.54 feet, United States Geological Survey datum.

Channel and Control.—Right bank is high and not subject to overflow; left overflows during extremely high stages. Bed is composed of coarse gravel.

Extremes of Stage.—Maximum gage height during the year, 17.95 feet observed at 6.10 a. m. March 10; minimum, 0.20 foot on several days in June and July.

Ice.—Stage-discharge relation usually affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

Daily Mean Gage Height, in feet, of North Branch Susquehanna River at Vestal, N. Y., for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11.83	2.05	8.58	3.95	3.95	8.08	7.50	6.92	1.32	0.20	3.18	1.25
2	12.51	2.48	13.85	3.90	3.90	10.36	7.11	8.54	1.30	.20	4.12	1.05
3	9.98	2.98	13.79	5.10	3.88	13.00	7.35	7.45	1.22	.2	3.35	1.00
4	6.52	3.25	11.54	5.00	3.95	16.13	6.50	------	1.15	.20	2.98	1.25
5	5.70	3.25	10.95	5.72	3.80	12.39	5.38	7.98	1.15	.78	2.85	1.40
6	5.10	3.15	10.88	6.08	3.70	9.96	4.48	7.35	1.05	.92	2.70	1.32
7	4.25	3.15	10.55	5.65	3.70	11.73	4.20	6.00	1.00	.78	2.65	1.28
8	3.52	2.78	9.58	5.42	3.78	13.72	4.12	5.65	.98	.72	2.75	1.25
9	2.95	2.58	7.80	5.05	3.62	14.80	4.05	4.95	.88	.70	2.55	------
10	2.55	3.05	6.60	4.20	3.55	17.03	4.00	4.18	.85	1.15	2.50	1.22
11	2.05	2.90	6.10	3.60	3.50	14.15	3.75	3.55	.75	.80	2.45	1.18
12	2.02	3.25	5.90	3.40	3.15	11.70	3.30	2.98	.90	1.45	2.40	.98
13	1.95	3.02	5.25	3.35	3.00	10.25	2.98	2.70	.85	1.75	2.38	.95
14	2.35	2.85	8.34	3.30	2.72	9.88	2.85	2.55	.80	1.45	2.30	.90
15	2.20	2.35	14.42	3.30	2.62	9.20	2.65	2.50	.80	2.35	3.12	.90
16	1.95	2.00	12.17	3.25	2.60	10.55	2.55	2.18	.75	4.00	3.05	.98
17	1.80	4.34	9.93	3.92	4.20	10.12	2.75	1.88	.75	6.60	3.40	.95
18	1.68	7.05	8.80	3.88	7.05	9.60	3.75	1.72	.85	6.62	3.50	1.25
19	1.58	5.60	7.30	3.52	8.08	9.45	4.82	1.42	.80	4.78	3.18	1.12
20	1.80	4.70	4.95	3.50	6.82	9.30	4.02	1.25	.75	3.92	3.00	1.02
21	1.72	4.05	5.58	4.58	6.05	9.08	3.90	1.15	.70	3.75	3.15	1.22
22	1.70	4.53	5.42	6.79	5.20	8.75	3.90	.95	.65	3.48	3.05	1.58
23	1.65	12.11	6.71	9.11	4.30	8.35	7.73	.90	.52	3.05	2.88	1.60
24	1.60	14.65	7.33	6.62	3.72	7.72	10.63	.90	.45	2.75	2.70	1.78
25	1.38	11.94	6.95	5.28	3.62	6.95	7.75	.90	.38	2.50	2.68	1.80
26	1.15	8.80	6.80	4.75	3.40	7.10	6.60	------	.30	2.12	2.55	1.52
27	1.05	6.88	6.50	4.65	3.35	7.00	5.60	------	.22	1.92	2.50	1.32
28	1.05	6.05	5.35	4.40	3.95	8.78	4.85	------	.20	1.88	2.45	1.25
29	2.66	5.15	4.75	4.35	------	8.20	4.38	1.00	.20	1.85	2.12	1.15
30	4.37	4.40	4.28	4.35	------	7.52	4.05	1.15	.20	2.95	1.75	1.05
31	3.06	------	3.75	4.20	------	7.12	------	1.48	------	4.20	1.58	------

NOTE—Stage-discharge relation Jan. 17 to Feb. 28 affected by ice. Gage height not observed on days of no record.

SUSQUEHANNA BASIN—STATION NO. 3

CHEMUNG RIVER AT CORNING, N. Y.

Location.—At four-span steel highway bridge, Bridge Street, Corning, Steuben County.

Drainage Area.—1,940 square miles.

Records Available.—December 1, 1909, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to tenths once daily by C. H. Voorhees, Jr.; during high stages more frequently. Elevation of gage zero 912.82 feet, United States Geological Survey datum.

Channel and Control.—River confined by dykes on both sides which overflow at gage height 23.6 feet. Bed is composed of gravel.

Extremes of Stage.—Maximum gage height during the year, estimated from hydrograph, 12.0 feet at 5 a. m. February 17; minimum, 1.8 feet on September 2 and 3.

Ice.—Stage-discharge relation usually affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

Daily Mean Gage Height, in feet, of Chemung River at Corning, N. Y., for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.7	2.2	4.5	3.3	2.9	5.6	5.5	4.7	3.4	2.5	2.3	1.9
2	4.5	2.2	7.1	3.5	2.9	5.8	5.3	5.3	3.1	2.5	2.3	1.8
3	4.0	2.4	6.3	4.3	2.9	7.5	4.9	4.7	2.9	2.5	2.3	1.8
4	3.8	2.3	5.4	3.8	2.9	6.3	4.5	4.4	2.8	2.4	2.4	2.4
5	3.7	2.3	5.1	3.7	2.9	5.2	4.3	4.3	2.8	2.4	2.4	2.8
6	3.5	2.3	4.9	3.8	3.0	5.4	4.0	5.3	2.8	2.4	2.4	2.6
7	3.2	2.3	4.6	3.5	3.2	8.5	3.9	4.6	2.7	2.3	2.4	2.8
8	2.9	2.3	4.2	3.6	3.1	7.6	3.7	4.2	2.6	2.2	2.5	2.7
9	2.6	2.3	4.0	3.3	3.0	8.3	3.7	4.0	2.6	2.2	2.5	2.5
10	2.6	2.3	3.7	3.1	3.0	7.9	3.8	3.9	2.6	2.3	2.4	2.2
11	2.5	2.4	3.6	3.6	3.0	6.3	3.7	3.8	2.5	2.3	2.4	2.3
12	2.3	2.3	3.4	3.4	3.0	6.1	3.7	3.5	2.6	2.2	2.5	2.3
13	2.3	2.2	3.5	3.0	3.0	7.7	3.5	3.4	2.7	2.2	2.4	2.2
14	2.3	2.2	3.9	3.4	2.9	6.4	3.5	3.5	2.7	2.1	2.4	2.1
15	2.3	2.2	5.4	3.2	3.0	5.9	3.5	3.4	2.6	2.4	2.5	2.0
16	2.3	2.0	4.6	3.0	3.6	5.6	3.4	3.2	2.5	2.7	2.3	1.9
17	2.2	2.4	4.2	3.0	9.8	5.4	3.4	3.1	2.4	2.9	2.3	2.1
18	2.2	2.5	4.0	3.1	5.7	5.0	3.8	3.0	2.5	2.5	2.4	2.3
19	2.2	2.6	3.8	3.0	4.7	4.7	3.7	3.0	2.5	2.5	2.3	2.9
20	2.2	2.7	3.5	3.0	4.0	4.5	3.6	2.9	2.5	2.6	2.3	2.7
21	2.2	3.9	3.3	2.9	3.5	4.7	3.5	2.9	2.4	2.6	2.2	2.7
22	2.1	5.2	3.4	3.1	3.5	4.7	3.3	2.8	2.4	2.5	2.2	3.5
23	2.1	5.4	3.4	3.2	3.5	4.4	4.3	2.9	2.4	2.4	2.2	3.2
24	2.1	6.1	4.3	3.5	3.4	4.3	7.0	2.9	2.3	2.3	2.1	2.8
25	2.1	-------	3.9	3.1	3.0	4.2	4.7	3.0	2.3	2.3	2.1	2.6
26	2.1	4.8	3.5	3.0	3.0	4.4	4.8	3.0	2.3	2.4	2.1	2.6
27	2.1	4.5	3.4	3.1	3.0	4.3	4.5	2.9	-------	2.4	2.1	2.5
28	2.1	4.4	3.6	3.0	4.3	4.2	4.2	2.9	-------	2.4	2.1	2.4
29	2.1	4.4	3.4	2.9	-------	5.2	4.0	2.8	-------	2.5	2.0	2.4
30	2.2	4.2	3.4	2.9	-------	4.6	4.7	3.0	2.6	2.5	2.0	2.5
31	2.2	-------	3.3	2.9	-------	4.4	-------	3.4	-------	2.4	2.0	-------

NOTE—Gage height not observed on days of no record. Stage-discharge relation Jan. 11 to Feb. 16 affected by ice.

NORTH BRANCH SUSQUEHANNA RIVER AT TOWANDA

Location.—At four-span steel highway bridge, Bridge Street, Towanda, Bradford County.

Drainage Area.—7,770 square miles.

Records Available.—December 1. 1892, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Hiram E. Bull. Elevation of gage zero 693.4 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and rock. Control is at a riffle extending downstream from right end of bridge to island and from left side of island to left bank; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 12.3 feet at 1 p. m. March 10 (discharge, 71,700 second-feet); minimum, 0.75 foot from 6 p. m. June 27 to 8 a. m. June 28 and at 10 a. m. July 10 (discharge, 1,120 second-feet).

Ice.—Stage-discharge usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined between 1,200 and 20,000 second-feet and well defined from 20,000 to 167,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for low stages when they may be only fair.

Discharge measurements of North Branch Susquehanna River at Towanda, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
26	Apr. 12	H. J. McIntyre	2.93	8,000
27	Sept. 14	J. M. Snavely	.89	1,250

Daily Mean Gage Height, in feet, of North Branch Susquehanna River at Towanda, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.68	1.95	4.67	2.70	3.02	4.43	4.95	4.05	1.92	0.92	1.78	0.89
2	7.45	1.75	8.62	2.72	2.88	5.83	5.45	5.08	1.78	.90	1.64	.89
3	6.30	1.75	10.06	3.59	2.70	7.63	5.10	4.90	1.60	.94	1.54	.92
4	4.75	2.08	8.64	4.15	2.48	9.60	4.40	4.25	1.50	.92	1.35	1.35
5	3.85	2.28	6.88	3.70	2.38	7.60	4.00	4.05	1.45	.89	1.25	1.40
6	3.38	2.16	6.88	3.65	2.40	5.92	3.69	4.75	1.45	.87	1.24	1.42
7	3.14	1.99	6.95	3.62	2.65	7.69	3.45	4.55	1.38	.87	1.20	1.22
8	2.85	1.88	6.38	3.22	2.75	10.00	3.25	3.90	1.31	.84	1.72	1.35
9	2.65	1.82	5.25	3.18	2.40	11.06	3.10	3.42	1.20	.82	1.26	1.18
10	2.48	1.80	4.40	3.02	2.20	11.86	3.10	3.10	1.20	.76	1.29	1.02
11	2.26	1.80	3.96	2.75	3.01	9.78	3.10	2.85	1.15	.98	1.39	.98
12	2.20	1.82	3.78	2.70	3.02	7.65	2.92	2.65	1.14	1.02	1.38	.92
13	2.10	1.85	3.62	2.55	2.01	7.88	2.75	2.49	1.10	1.22	1.34	.90
14	2.06	1.72	4.16	2.40	1.98	8.05	2.58	2.46	1.10	1.28	1.52	.88
15	1.98	1.70	7.47	2.35	1.80	6.80	2.52	2.40	1.06	1.20	1.78	.84
16	1.86	1.68	7.55	2.65	1.85	6.02	2.44	2.32	1.02	1.71	1.58	.81
17	1.82	2.35	6.40	2.80	5.71	6.60	2.47	2.18	1.00	2.86	1.35	.87
18	1.70	4.07	5.25	3.15	5.71	5.55	2.66	2.04	.99	2.54	1.38	.85
19	1.72	3.85	4.35	3.30	4.65	5.10	3.00	1.96	.95	2.10	1.38	1.09
20	1.70	3.40	3.90	3.30	4.00	4.65	3.30	1.88	.94	1.82	1.38	1.11
21	1.70	3.20	3.44	3.30	3.08	4.64	3.12	1.78	.90	1.95	1.70	1.17
22	1.58	3.22	3.32	3.30	2.78	4.95	2.85	1.68	.89	2.24	1.58	1.20
23	1.50	4.57	3.35	4.05	2.72	4.70	3.80	1.62	.86	2.25	1.44	1.40
24	1.45	7.68	4.10	4.50	2.60	4.20	7.43	1.62	.80	1.85	1.35	1.40
25	1.45	7.30	4.12	3.70	2.28	4.08	6.49	1.66	.80	1.70	1.30	1.33
26	1.38	5.82	3.35	3.00	2.28	4.30	5.24	1.70	.80	1.70	1.22	1.20
27	1.28	5.00	2.82	3.50	2.28	4.08	4.30	1.88	.76	1.32	1.12	1.05
28	1.30	4.62	2.75	3.40	2.55	4.72	3.85	1.80	.76	1.20	1.06	1.05
29	1.72	4.42	2.70	3.10	------	4.78	3.42	1.84	.78	1.18	1.01	.97
30	2.15	4.16	2.82	3.00	------	4.50	3.30	1.85	.84	1.16	.92	.88
31	2.15	------	2.86	3.00	------	4.22	------	2.12	------	2.05	.92	------

NOTE—Stage-discharge relation Jan. 16 to Feb. 6 and Feb. 11-14 affected by ice.

Daily discharge, in second-feet, of North Branch Susquehanna River at Towanda, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30,200	3,600	17,700	6,470	5,500	15,900	19,500	13,500	3,440	1,310	3,140	1,310
2	34,800	3,000	43,100	6,470	4,800	24,500	22,000	20,100	3,140	1,310	2,730	1,310
3	27,600	3,000	54,300	11,200	4,000	36,100	20,100	18,900	2,600	1,380	2,480	1,310
4	18,300	4,070	43,100	14,700	3,800	50,500	15,900	14,700	2,360	1,310	2,040	2,040
5	12,300	4,770	31,500	11,800	4,000	36,100	13,500	13,500	2,250	1,310	1,850	2,140
6	10,100	4,240	31,500	11,200	4,800	25,100	11,800	18,300	2,250	1,240	1,850	2,140
7	8,530	3,750	32,200	11,200	6,000	36,800	10,100	17,100	2,140	1,240	1,760	1,760
8	6,970	3,440	28,300	9,050	6,970	53,500	9,050	12,900	1,940	1,240	2,860	2,040
9	6,000	3,140	20,700	9,050	5,150	62,000	8,530	10,100	1,760	1,180	1,850	1,760
10	5,560	3,140	15,900	8,010	4,410	68,400	8,530	8,530	1,760	1,120	1,940	1,450
11	4,590	3,140	13,500	6,970	3,800	52,000	8,530	6,970	1,680	1,450	2,140	1,450
12	4,410	3,140	12,300	6,470	3,200	36,100	7,490	6,000	1,680	1,450	2,140	1,310
13	4,070	3,290	11,200	6,000	3,000	38,200	6,970	5,560	1,600	1,760	2,040	1,310
14	3,910	2,860	14,700	5,150	3,000	38,900	6,000	5,360	1,600	1,940	2,360	1,310
15	3,750	2,860	35,400	4,960	3,140	30,800	5,560	5,150	1,520	1,760	3,140	1,240
16	3,290	2,860	36,100	5,000	3,290	25,800	5,360	4,770	1,450	2,860	2,600	1,180
17	3,140	4,960	28,300	4,400	23,900	25,800	5,360	4,410	1,450	7,490	[illegible]	1,240
18	2,860	14,100	20,700	3,800	23,900	23,300	6,470	3,910	1,450	5,560	2,140	1,600
19	2,860	12,300	15,900	3,200	17,100	20,100	8,010	3,600	1,380	4,070	2,140	1,600
20	2,860	10,100	12,900	2,800	13,500	17,100	9,600	3,440	1,380	3,140	2,140	1,600
21	2,860	9,050	10,100	2,800	8,530	17,100	8,530	3,140	1,310	3,600	2,860	1,680
22	2,600	9,050	9,600	4,400	6,970	19,500	6,970	2,860	1,310	4,590	2,600	1,760
23	2,360	17,100	10,100	7,500	6,470	17,700	12,300	2,600	1,240	4,590	2,250	2,140
24	2,250	36,800	14,100	6,500	6,000	14,700	34,800	2,600	1,180	3,290	2,040	2,140
25	2,250	34,100	14,100	5,500	4,770	14,100	28,900	2,730	1,180	2,860	1,940	2,040
26	2,140	24,500	10,100	4,400	4,770	15,300	20,700	2,860	1,180	2,360	1,760	1,760
27	1,940	19,500	6,970	3,800	4,770	17,700	15,300	3,440	1,120	1,940	1,600	1,520
28	1,940	17,100	6,970	3,800	6,000	17,700	12,300	3,140	1,120	1,760	1,520	1,520
29	2,860	15,900	6,470	4,000	------	18,200	10,100	3,290	1,180	1,760	1,450	1,380
30	4,240	14,700	6,970	4,800	------	16,500	9,600	3,290	1,240	1,680	1,310	1,310
31	4,240	------	7,490	5,500	------	14,700	------	4,070	------	3,910	1,310	------

NOTE—Discharge Jan. 16 to Feb. 6 and Feb. 11-14 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for North Branch Susquehanna River at Danville.

Monthly discharge of North Branch Susquehanna River, at Towanda, for the year ending Sept. 30, 1921

(Drainage area 7,770 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	34,800	1,940	7,280	0.937	1.08
November	36,800	2,860	9,790	1.26	1.41
December	54,300	6,470	20,100	2.59	2.99
January	14,700	2,800	6,480	.834	.96
February	23,900	3,000	6,980	.898	.93
March	68,400	14,100	29,000	3.73	4.30
April	34,800	5,360	12,300	1.58	1.76
May	20,100	2,600	7,450	.959	1.11
June	3,440	1,120	1,700	.219	.24
July	7,490	1,120	2,470	.318	.37
August	3,140	1,310	2,130	.274	.32
September	2,140	1,180	1,600	.206	.23
The year	68,400	1,120	8,980	1.16	15.70

SUSQUEHANNA BASIN—STATION NO. 5

TOWANDA CREEK NEAR MONROETON

Location.—At single-span Steel highway bridge about one and a half miles southwest of Monroeton, Bradford County.

Drainage Area.—218 square miles.

Records Available.—January 30, 1914, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Leon D. Pepper.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Neither bank is subject to overflow. Bed is composed of coarse gravel. Control consists of the foundation timbers of an old wooden dam and a gravel bar which probably shifts.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 5.7 feet at 7 p. m. April 23 (discharge, about 5,300 second-feet); minimum, 1.58 feet at 5 p. m. September 1 (discharge, 9 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation probably permanent throughout the year except when affected by ice. Rating curve well defined between 10 and 500 second-feet and fairly well defined from 500 to 2,000 second-feet. Gage read to hundredths twice daily. Results good except for high stages when they are fair.

Discharge Measurements of Towanda Creek near Monroeton, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
24	Apr. 11	H. J. McIntyre	2.72	224
25	Sept. 14*	J. M. Snavely	1.77	13.0

*Measurement made by wading 200 feet below gage.

Daily Mean Gage Height, in feet, of Towanda Creek near Monroeton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.75	2.52	4.07	2.68	2.60	3.58	3.50	3.70	2.34	2.04	1.92	1.59
2	2.88	2.50	4.42	2.64	2.60	3.50	3.30	3.62	2.28	2.09	1.88	1.65
3	2.65	2.77	3.68	2.63	2.54	4.06	3.26	3.25	2.24	2.02	2.02	1.74
4	2.56	2.68	3.40	2.58	2.51	3.62	3.12	3.12	2.45	1.92	2.01	2.00
5	2.49	2.59	3.35	2.56	2.58	3.25	2.99	3.30	2.29	1.88	1.96	1.98
6	2.46	2.52	3.18	2.54	3.11	3.33	2.88	3.22	2.21	2.35	1.87	1.96
7	2.45	2.48	3.00	2.48	2.85	4.31	2.82	3.05	2.18	2.10	1.92	1.98
8	2.34	2.48	2.88	2.51	2.56	4.55	2.78	2.89	2.15	1.93	2.07	1.88
9	2.31	2.46	2.79	2.60	2.57	4.67	2.92	2.78	2.11	1.92	1.98	------
10	2.28	2.45	2.75	2.56	2.48	4.28	2.84	2.71	2.07	1.96	1.88	------
11	2.25	2.44	2.72	2.43	2.48	3.76	2.73	2.63	2.08	2.02	1.82	------
12	2.23	2.41	2.68	2.44	2.54	3.50	2.68	2.59	2.13	2.24	2.06	------
13	2.22	2.37	2.64	2.40	2.54	3.70	2.63	2.72	2.15	2.02	1.93	------
14	2.20	2.30	4.03	2.40	2.44	3.42	2.60	2.66	2.11	1.97	1.91	1.76
15	2.17	2.31	4.04	2.57	2.61	3.34	2.62	2.54	2.06	2.12	1.90	1.76
16	2.17	2.31	3.45	2.51	3.02	3.78	2.65	2.49	2.01	2.18	1.86	1.76
17	2.20	3.62	3.18	2.40	4.16	3.32	2.90	2.42	1.99	2.01	1.81	1.77
18	2.18	3.57	3.03	2.40	3.30	3.16	2.88	2.40	2.03	1.92	1.81	1.96
19	2.14	3.16	2.86	2.45	2.95	3.02	2.81	2.36	1.99	1.90	1.79	2.04
20	2.12	3.22	2.80	2.50	2.95	3.04	2.76	2.32	1.94	2.55	1.77	1.92
21	2.14	3.26	2.74	2.54	2.89	3.02	2.71	2.26	1.91	2.26	1.72	1.92
22	2.10	3.26	2.66	2.92	2.85	3.02	2.62	2.20	1.88	2.10	1.70	2.38
23	2.10	3.82	3.08	2.98	2.70	2.92	3.84	2.36	1.86	2.02	1.68	2.22
24	2.10	3.54	2.94	2.72	2.68	2.86	4.11	2.39	1.86	1.95	1.66	2.08
25	2.10	3.32	2.78	2.52	2.61	3.72	3.48	2.48	1.80	1.89	1.66	2.02
26	2.06	3.20	2.62	2.65	2.60	3.28	3.20	2.64	1.80	1.86	1.66	1.99
27	2.10	3.11	2.77	2.60	2.54	3.12	3.02	2.48	1.80	1.81	1.65	1.90
28	2.55	3.08	2.64	2.58	2.95	3.08	2.88	2.33	1.86	1.80	1.63	1.92
29	2.85	2.98	2.80	2.58	------	3.12	2.82	2.48	2.00	1.82	1.61	1.89
30	2.82	2.86	2.73	2.59	------	2.99	2.89	2.54	1.98	2.00	1.60	1.80
31	2.62	------	2.66	2.60	------	2.94	------	2.42	------	1.99	1.60	------

NOTE—Stage-discharge relation Jan. 18-20 affected by ice. Gage height Sept. 9-13 not observed.

Daily discharge, in second-feet, of Towanda Creek near Monroeton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,100	136	1,500	205	167	930	825	1,040	80	25	17	9
2	318	128	2,090	186	167	825	625	930	66	30	15	10
3	191	254	1,040	181	144	1,500	591	582	58	22	22	12
4	151	205	720	159	132	930	480	480	112	17	21	20
5	125	163	672	151	159	582	388	625	68	15	18	19
6	115	136	525	144	472	654	318	557	52	82	15	18
7	112	121	395	121	300	1,910	282	430	46	32	17	19
8	80	121	318	132	151	2,380	259	324	41	17	27	15
9	72	115	264	167	155	2,580	343	259	34	17	19	15
10	66	112	242	151	121	1,910	294	220	27	18	15	15
11	60	108	226	105	121	1.100	232	181	29	22	14	14
12	56	98	205	108	144	825	205	163	37	58	26	16
13	54	88	186	95	144	1,040	181	226	41	22	17	15
14	50	70	1,500	95	108	741	167	196	34	19	16	12
15	45	72	1,500	155	172	663	177	144	26	36	16	12
16	45	72	772	132	409	1,160	191	125	21	46	15	12
17	50	930	525	95	1,660	644	330	102	20	21	13	12
18	46	877	416	70	625	510	318	95	24	17	13	18
19	39	510	306	60	362	409	276	85	20	16	13	25
20	36	557	270	80	362	423	248	75	18	148	12	17
21	39	591	237	144	324	409	220	62	16	62	11	17
22	32	591	196	343	300	409	177	50	15	32	11	90
23	32	1,160	451	382	215	343	1,220	85	15	22	11	54
24	32	877	356	226	205	306	1,580	92	15	18	10	29
25	32	644	259	136	172	1,040	804	121	13	16	10	22
26	26	540	177	191	167	608	540	186	13	15	10	20
27	32	472	254	167	144	480	409	121	13	13	10	16
28	148	451	186	159	362	451	318	78	15	13	10	17
29	300	382	270	159	------	480	282	121	20	14	9	16
30	282	306	232	163	------	388	324	144	19	20	9	13
31	177	------	196	167	------	356	------	102	------	20	9	------

NOTE—Discharge Jan. 18-20 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Lycoming Creek near Trout Run. Discharge Sept. 9-13 estimated, because of no gage height record, from discharge of Lycoming Creek near Trout Run.

Monthly discharge of Towanda Creek near Monroeton, for the year ending Sept. 30, 1921
(Drainage area 218 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,100	26	127	0.583	0.67
November	1,160	70	363	1.67	1.86
December	2,090	177	532	2.44	2.81
January	382	60	156	.716	.83
February	1,660	108	284	1.30	1.35
March	2,580	306	871	4.00	4.61
April	1,580	167	420	1.93	2.15
May	1,040	50	258	1.18	1.36
June	112	13	33.6	.154	.17
July	148	13	29.8	.137	.16
August	27	9	14.5	.067	.08
September	90	9	20.0	.092	.10
The year	2,580	9	259	1.19	16.15

SUSQUEHANNA BASIN—STATION NO. 6

TUNKHANNOCK CREEK AT DIXON

Location.—At single-span steel highway bridge, about two miles east of Tunkhannock, at Dixon, Wyoming County.

Drainage Area.—393 square miles.

Records Available.—January 28, 1914, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by N. L. Kneller.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—The right bank is high, steep, and does not overflow; the left is low but not subject to overflow. Bed is composed of coarse gravel. Control is at a riffle, where the bed is composed of boulders, about 300 feet below gage; permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 9.3 feet at midnight, September 30—October 1, 1920 (discharge, about 9,900 second-feet); minimum, 1.00 foot at 5 p. m. August 29 and several times in September (discharge, 32 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined between 30 and 4,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Tunkhannock Creek at Dixon, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
25	Apr. 13	H. J. McIntyre	2.21	336
26	May 17*	H. J. McIntyre,	1.84	196

*Measurement made by wading 100 feet above gage.

Daily Mean Gage Height, in feet, of Tunkhannock Creek at Dixon, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.91	2.48	4.87	2.20	2.12	5.25	3.62	3.37	1.58	1.68	1.25	1.10
2	4.32	2.58	6.38	2.62	1.98	4.79	3.28	3.02	1.45	1.62	1.30	1.10
3	3.58	4.79	4.88	2.70	1.80	6.43	3.05	2.68	1.30	1.50	1.30	1.05
4	3.28	3.50	4.18	2.45	1.80	4.82	2.88	2.58	1.38	1.40	1.28	1.10
5	3.10	3.15	4.35	2.38	2.08	3.60	2.72	2.45	1.52	1.30	1.28	1.10
6	2.75	2.85	3.92	2.55	3.21	4.30	2.62	2.45	1.35	1.28	1.20	1.05
7	2.60	2.70	3.55	2.30	2.45	5.10	2.52	2.28	1.35	1.25	1.22	1.15
8	2.48	2.72	3.25	2.50	2.05	5.48	2.42	2.15	1.28	1.20	1.45	1.12
9	2.38	2.62	3.00	2.38	1.90	6.05	2.52	2.02	1.25	1.20	1.48	1.08
10	2.30	2.60	2.90	2.15	1.88	7.06	2.48	1.95	1.22	1.38	1.40	1.08
11	2.18	2.52	2.85	2.20	1.95	4.70	2.32	1.90	1.20	1.48	1.30	1.00
12	2.08	2.38	2.78	2.22	1.90	3.98	2.20	1.82	1.22	1.40	1.95	1.02
13	2.08	2.30	2.68	2.05	1.85	4.05	2.18	2.15	1.20	1.35	1.90	1.08
14	2.02	2.22	4.92	2.31	1.85	3.65	2.12	2.18	1.20	1.32	1.58	1.08
15	2.00	2.20	5.61	3.13	1.72	3.40	2.00	2.05	1.22	1.42	1.60	1.05
16	2.00	2.27	4.22	2.52	2.73	3.28	2.02	1.82	1.15	1.75	1.52	1.02
17	2.15	4.39	3.72	2.20	4.72	3.45	3.47	1.78	1.22	1.52	1.55	1.02
18	2.05	3.75	3.38	1.90	3.35	3.18	3.15	1.72	1.28	1.32	1.35	1.05
19	1.98	3.28	3.02	1.98	2.48	2.92	3.14	1.75	1.25	1.30	1.25	1.05
20	1.95	3.05	2.78	2.12	2.48	3.02	2.75	1.62	1.20	1.88	1.28	1.15
21	1.90	2.98	2.62	2.02	2.18	2.98	2.58	1.58	1.20	1.75	1.22	1.15
22	1.85	2.92	2.65	2.30	2.28	3.08	2.48	1.55	1.20	1.52	1.20	1.80
23	1.80	4.67	3.30	2.65	2.12	2.70	3.37	1.62	1.15	1.40	1.18	1.75
24	1.72	4.28	3.02	2.32	2.05	2.73	4.16	1.58	1.20	1.32	1.20	1.40
25	1.70	3.75	2.62	2.08	1.80	3.76	3.25	1.68	1.20	1.28	1.20	1.30
26	1.65	3.48	2.28	1.92	1.88	3.46	2.98	2.00	1.20	1.28	1.20	1.35
27	1.78	3.22	2.42	1.92	2.01	3.30	2.70	1.70	1.15	1.25	1.18	1.32
28	2.92	3.28	2.50	1.85	4.10	3.05	2.55	1.55	1.20	1.25	1.12	1.28
29	2.92	3.22	2.28	1.78	-------	2.82	2.42	1.82	1.20	1.38	1.05	1.22
30	2.98	3.05	2.35	1.82	-------	2.70	2.60	1.78	1.42	1.28	1.08	1.20
31	2.62	-------	2.30	2.18	-------	2.80	-------	1.65	-------	1.25	1.08	-------

Daily discharge, in second-feet, of Tunkhannock Creek at Dixon, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,490	510	2,680	345	295	3,040	1,320	1,110	106	130	54	39
2	2,010	570	4,710	570	242	2,560	1,070	840	82	115	59	39
3	1,320	2,560	2,680	630	169	4,710	875	630	59	90	59	36
4	1,070	1,230	1,900	480	169	2,560	770	570	70	73	57	39
5	910	950	2,120	450	295	1,320	630	480	62	59	57	39
6	665	735	1,600	540	990	2,010	570	480	66	57	48	36
7	570	630	1,320	395	480	2,920	510	395	66	54	50	44
8	510	630	1,030	510	272	3,430	450	320	57	48	82	41
9	450	570	840	450	208	4,130	510	250	54	48	87	38
10	395	570	770	320	200	5,810	510	229	50	70	73	38
11	345	510	735	345	229	2,450	395	208	48	87	59	32
12	295	450	700	345	208	1,700	345	177	50	73	229	33
13	295	395	630	272	188	1,700	345	320	48	66	208	38
14	250	345	2,680	395	188	1,320	295	345	48	62	106	38
15	250	345	3,570	950	142	1,150	250	272	50	76	110	36
16	250	370	1,900	510	665	1,070	250	177	44	152	94	33
17	320	2,120	1,410	345	2,450	1,190	1,190	162	50	94	82	33
18	272	1,500	1,150	208	1,110	990	950	142	57	62	66	36
19	242	1,070	840	242	510	770	950	152	54	59	54	36
20	229	875	700	295	510	840	665	115	48	200	57	44
21	208	840	570	250	345	840	570	106	48	152	50	44
22	188	770	600	395	395	910	510	100	48	94	48	169
23	169	2,450	1,070	600	295	630	1,110	115	44	73	46	152
24	142	2,010	840	395	272	665	1,900	106	48	62	48	73
25	135	1,500	570	295	169	1,500	1,030	130	48	57	48	59
26	122	1,230	395	216	200	1,190	840	250	48	57	48	66
27	162	990	450	216	250	1,070	630	135	44	54	46	62
28	770	1,070	510	188	1,800	875	540	100	48	54	41	57
29	770	990	395	162	-------	700	450	177	48	70	36	50
30	840	875	422	177	-------	630	570	162	76	57	38	48
31	570	-------	395	345	-------	700	-------	122	-------	54	38	-------

Monthly discharge of Tunkhannock Creek at Dixon, for the year ending Sept. 30, 1921

(Drainage area 393 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	5,490	122	652	1.66	1.91
November	2,560	345	989	2.52	2.81
December	4,710	395	1,300	3.31	3.82
January	950	162	382	.972	1.12
February	2,450	142	473	1.20	1.25
March	5,810	630	1,790	4.55	5.25
April	1,900	250	700	1.78	1.99
May	1,110	100	286	.728	.84
June	106	44	55.6	.141	.16
July	200	48	79.3	.202	.23
August	229	36	70.3	.179	.21
September	169	32	50.9	.130	.14
The year	5,810	32	570	1.45	19.73

SUSQUEHANNA BASIN—STATION NO. 7

LACKAWANNA RIVER AT MOOSIC

Location.—At single-span steel highway bridge, River Street or Moosic Road, Moosic, Lackawanna County.

Drainage Area.—265 square miles.

Records Available.—August 8, 1913, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Nelson B. Ross.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of culm and rocks. Control for low stages is at a slight riffle about 50 feet below gage; for medium and high stages at a pronounced riffle about 1,000 feet downstream; occasionally shifting.

Extremes of Discharge.—Maximum stage during the year, 5.40 feet observed at 8 a. m. March 10 (discharge, 3,300 second-feet); minimum, 1.82 feet at 5 p. m. September 5 (discharge, 84 second-feet).

Ice.—Stage-discharge relation rarely affected by ice.

Accuracy.—Stage-discharge relation probably permanent throughout the year. Rating curve fairly well defined between 100 and 1,600 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Lackawanna River at Moosic, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
35	Apr. 14	H. J. McIntyre	2.33	321
36	May 16	H. J. McIntyre	2.38	350

Daily Mean Gage Height, in feet, of Lackawanna River at Moosic, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.98	2.66	4.16	2.40	2.24	3.38	3.21	3.51	2.24	2.08	2.01	1.88
2	3.58	2.66	5.02	2.62	2.21	3.24	3.07	3.41	2.19	2.12	2.10	2.00
3	3.18	3.69	4.38	2.60	2.20	4.37	2.95	3.13	2.12	2.02	2.08	2.10
4	2.95	3.30	3.75	2.56	2.18	4.35	2.85	2.95	2.20	1.94	2.02	1.94
5	2.82	3.08	4.02	2.48	2.25	3.80	2.75	2.99	2.16	1.96	2.00	1.84
6	2.72	2.85	3.82	2.44	2.39	3.76	2.67	2.87	2.11	1.96	2.00	1.98
7	2.62	2.76	3.38	2.36	2.31	4.52	2.62	2.75	2.08	1.91	2.00	1.92
8	2.52	2.82	3.10	2.62	2.28	5.11	2.59	2.65	2.10	1.90	2.31	1.89
9	2.38	2.68	2.92	2.48	2.26	5.07	2.63	2.59	2.09	1.89	2.08	1.90
10	2.35	2.62	2.90	2.34	2.22	5.25	2.57	2.61	2.06	2.35	2.02	1.90
11	2.32	2.52	2.86	2.30	2.28	4.32	2.47	2.65	2.08	2.72	2.00	1.95
12	2.32	2.52	2.74	2.29	2.26	3.82	2.45	2.52	2.02	2.38	2.15	1.92
13	2.32	2.49	2.70	2.28	2.22	3.84	2.43	2.59	2.01	2.20	2.10	1.90
14	2.29	2.38	3.90	2.58	2.32	3.48	2.35	2.63	2.04	2.08	2.02	1.90
15	2.26	2.35	3.95	2.84	2.31	3.32	2.41	2.43	2.01	2.51	2.00	1.90
16	2.22	2.38	3.50	2.64	2.34	3.42	2.35	2.38	2.00	2.58	2.01	1.90
17	2.32	3.28	3.24	2.52	2.85	3.30	3.41	2.28	2.12	2.35	2.00	2.10
18	2.22	3.12	3.08	2.36	2.78	3.22	3.08	2.21	2.06	2.22	2.08	1.89
19	2.20	2.96	3.01	2.30	2.55	3.05	2.91	2.22	1.98	2.16	2.03	1.88
20	2.20	2.86	2.85	2.29	2.48	2.99	2.85	2.20	1.91	3.02	2.00	1.90
21	2.14	2.79	2.76	2.31	2.42	3.05	2.71	2.20	1.96	2.76	1.92	1.98
22	2.12	2.80	2.62	2.49	2.42	2.95	2.64	2.19	1.96	2.52	1.94	2.24
23	2.10	3.98	3.03	2.68	2.42	2.81	2.99	2.22	1.99	2.30	1.96	2.05
24	2.02	3.90	3.01	2.48	2.36	2.75	3.58	2.18	1.99	2.22	1.98	1.99
25	2.08	3.45	2.75	2.45	2.31	3.17	3.21	2.27	1.91	2.14	1.98	1.92
26	2.08	3.15	2.68	2.42	2.28	3.53	2.98	2.38	1.90	2.11	1.96	1.99
27	2.19	3.02	2.66	2.26	2.34	3.43	2.89	2.24	1.90	2.08	1.94	1.98
28	3.00	2.96	2.61	2.20	3.13	3.25	2.75	2.20	1.98	2.02	1.94	1.88
29	2.98	2.88	2.46	2.20	------	3.08	2.67	2.28	1.95	2.02	1.94	1.89
30	2.92	2.80	2.44	2.24	------	2.92	2.89	2.36	2.01	2.06	1.92	1.96
31	2.75	------	2.42	2.36	------	2.81	------	2.34	------	2.01	1.89	------

Daily discharge, in second-feet, of Lackawanna River at Moosic, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,600	480	1,800	330	250	1,040	880	1,130	250	172	144	96
2	1,220	480	2,720	450	235	920	760	1,040	225	190	180	140
3	880	1,310	2,000	450	230	2,000	685	840	190	148	172	180
4	685	960	1,400	420	220	2,000	615	685	230	116	148	116
5	580	800	1,600	378	255	1,400	545	720	210	124	140	88
6	510	615	1,400	354	325	1,400	480	615	185	124	140	132
7	450	545	1,040	310	285	2,110	450	545	172	104	140	108
8	390	580	800	450	270	2,860	450	480	180	100	285	98
9	320	510	650	378	260	2,860	480	450	176	98	172	100
10	305	450	650	300	240	3,000	420	450	164	305	148	100
11	290	390	615	280	270	1,900	372	480	172	510	140	120
12	290	390	545	275	260	1,400	360	390	148	320	205	108
13	290	384	510	270	240	1,400	348	450	144	230	180	100
14	275	320	1,500	450	290	1,130	305	480	156	172	148	100
15	260	305	1,600	615	285	960	336	348	144	390	140	100
16	240	320	1,130	480	300	1,040	305	320	140	450	144	100
17	290	960	920	390	615	960	1,040	270	190	305	140	180
18	240	800	800	310	580	880	800	235	164	240	172	98
19	230	685	720	280	420	760	650	240	132	210	152	96
20	230	615	615	275	378	720	615	230	164	720	140	100
21	200	580	545	285	342	760	510	230	124	545	108	132
22	190	580	450	384	342	685	480	225	124	390	116	250
23	180	1,600	760	510	342	580	720	240	136	280	124	160
24	148	1,500	720	378	310	545	1,220	220	136	240	132	136
25	172	1,080	545	360	285	840	880	265	104	200	132	108
26	172	840	510	342	270	1,130	720	320	100	185	124	136
27	225	720	480	260	300	1,080	650	250	100	172	116	132
28	720	685	450	230	840	920	545	230	132	148	116	96
29	720	650	366	230	------	800	480	270	120	148	116	98
30	650	580	354	250	------	650	650	310	144	164	108	124
31	545	------	342	310	------	580	------	300	------	144	98	------

Monthly discharge of Lackawanna River at Moosic, for the year ending Sept. 30, 1921
(Drainage area 265 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,600	148	435	1.64	1.89
November	1,600	305	690	2.60	2.90
December	2,720	342	921	3.48	4.01
January	615	230	354	1.34	1.54
February	840	220	330	1.25	1.30
March	3,000	545	1,270	4.79	5.52
April	1,220	305	592	2.23	2.49
May	1,130	220	428	1.62	1.87
June	250	100	157	.592	.66
July	720	98	247	.932	1.07
August	285	98	146	.551	.64
September	250	88	121	.457	.51
The year	3,000	88	476	1.80	24.40

SUSQUEHANNA BASIN—STATION NO. 8

NORTH BRANCH SUSQUEHANNA RIVER AT WILKES-BARRE

Location.—At four-span steel highway bridge, Market Street, Wilkes-Barre, Luzerne County.

Drainage Area.—9,960 square miles.

Records Available.—November 1, 1890, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Milton Wentz. Elevation of gage zero 511.03 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge, except in extremely high stages when they are taken from the Port Bowkley railroad bridge, where the entire discharge of the stream is confined to one channel without overflow.

Channel and Control.—Right bank is low and subject to overflow at a stage of about 18.5 feet; left bank subject to overflow only at extremely high stages. Bed is composed of culm, sand and gravel. Control for low stages is at a riffle about 4,000 feet below gage; occasionally shifting. For high stages the control is probably the dam at Nanticoke, 9 miles below gage.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 19.0 feet at 10 a. m. March 10 (discharge, 86,600 second-feet); minimum, 2.01 feet September 16 and 17 (discharge, 1,330 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation probably permanent throughout the year except when affected by ice. Rating curve well defined between 1,500 and 160,000 second-feet. Gage read to hundredths once daily about two-thirds of the year and twice daily on other days: during high stages more frequently. Daily discharge ascertained by applying daily mean gage height, computed from a continuous daily hydrograph, obtained by plotting daily gage readings, to rating table. Results good.

The following discharge measurement was made by J. M. Snavely: No. 59, Sept. 14: Gage height, 2.13 feet; discharge, 1,490 second-feet.

Daily Mean Gage Height, in feet, of North Branch Susquehanna River at Wilkes-Barre; for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11.02	4.62	8.15	5.35	6.58	7.01	7.77	-------	4.05	2.31	2.75	2.11
2	12.24	4.28	11.55	5.34	5.62	9.95	8.92	-------	3.80	2.57	3.39	2.05
3	11.02	5.12	14.51	5.54	4.92	12.26	9.04	-------	3.66	2.51	3.31	2.03
4	9.60	5.05	13.95	6.62	4.52	14.38	8.65	-------	3.47	2.45	3.14	2.20
5	8.00	4.78	12.25	7.00	4.32	13.59	-------	8.40	3.26	2.36	2.94	2.24
6	6.77	4.84	11.25	6.48	4.52	11.48	-------	7.72	3.14	2.27	2.78	2.63
7	6.13	4.74	11.01	6.36	4.80	11.38	-------	8.26	3.10	2.23	2.82	2.84
8	5.73	4.50	10.72	6.31	5.02	15.20	-------	7.43	3.08	2.20	2.93	2.62
9	5.33	4.32	9.80	5.90	4.98	16.49	-------	6.82	3.02	2.17	2.73	2.43
10	5.01	4.09	8.60	5.64	4.79	18.34	-------	6.18	2.92	2.56	2.88	2.56
11	4.72	3.98	7.70	5.39	4.54	16.81	-------	5.70	2.78	2.79	2.75	2.53
12	4.48	4.01	7.10	5.28	4.20	14.20	-------	5.27	2.73	2.67	2.85	2.31
13	4.30	3.94	6.83	5.02	4.05	12.89	-------	5.18	2.67	2.60	3.14	2.21
14	4.11	3.84	6.77	4.95	4.00	13.03	-------	5.08	2.69	2.48	3.06	2.12
15	4.02	3.76	11.03	5.08	3.94	12.09	-------	4.89	2.56	2.90	2.91	2.03
16	3.92	3.68	12.61	4.90	4.40	10.90	-------	4.75	2.47	3.43	3.16	2.01
17	3.84	4.59	11.65	5.50	6.07	10.50	-------	4.52	2.46	4.17	3.04	2.01
18	3.79	7.03	10.05	5.36	11.17	10.10	-------	4.30	2.48	4.46	3.06	2.03
19	3.62	7.73	8.72	6.16	8.75	9.35	-------	4.10	2.46	4.49	2.75	2.03
20	3.54	7.25	7.63	4.93	7.60	8.71	-------	3.97	2.41	4.46	2.72	2.04
21	3.50	6.78	6.77	6.09	6.68	8.28	-------	3.89	2.38	4.00	2.72	2.39
22	3.40	6.31	6.39	5.76	5.95	8.42	-------	3.69	2.34	3.64	2.87	2.64
23	3.33	7.10	6.37	5.11	5.46	8.55	-------	3.60	2.30	3.96	3.04	2.79
24	3.22	9.90	6.89	7.76	5.25	8.18	-------	3.57	2.24	3.88	2.89	2.83
25	3.14	11.76	6.85	9.61	5.08	8.21	-------	3.52	2.19	3.73	2.73	2.92
26	3.10	10.72	6.57	10.42	4.57	8.19	-------	3.71	2.14	3.30	2.59	2.69
27	3.12	9.57	6.28	8.96	4.67	8.40	-------	3.74	2.10	3.03	2.54	2.72
28	3.48	8.63	5.63	8.45	5.20	8.74	-------	3.67	2.15	2.85	2.39	2.70
29	3.92	8.20	5.23	7.80	-------	8.40	-------	3.73	2.19	2.71	2.34	2.55
30	4.52	7.89	5.25	7.89	-------	8.30	-------	3.85	2.16	2.58	2.29	2.50
31	4.62	-------	5.46	7.60	-------	7.92	-------	3.84	-------	2.53	2.22	-------

NOTE—Stage-discharge relation Jan. 17 to Feb. 4 affected by ice. Gage height Apr. 5 to May 4 unsatisfactory because of bridge repairs.

Daily discharge, in second-feet, of North Branch Susquehanna River at Wilkes-Barre, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34,500	6,920	21,400	9,750	7,000	16,100	19,600	22,500	5,150	1,670	2,470	1,440
2	40,500	5,990	37,400	9,370	6,000	29,600	24,500		4,640	2,040	3,700	1,380
3	34,500	8,630	52,600	10,100	5,500	41,000	25,000		4,390	1,960	3,480	1,380
4	27,700	8,270	49,900	14,500	5,000	52,000	23,200		3,920	1,880	3,060	1,550
5	20,400	7,580	40,500	16,100	5,990	47,800	15,900	22,200	3,480	1,740	2,660	1,610
6	15,300	7,580	35,400	14,100	6,600	36,900		19,100	3,060	1,610	2,470	2,200
7	12,500	7,250	34,500	13,700	7,580	36,400		21,800	3,060	1,610	2,470	2,470
8	10,900	6,600	33,000	13,300	8,270	56,900		17,800	3,060	1,550	2,660	2,120
9	9,370	5,990	28,700	11,700	8,270	66,100		15,300	2,860	1,500	2,290	1,880
10	8,270	5,420	23,200	10,500	7,580	80,700		12,900	2,660	2,040	2,660	2,040
11	7,250	5,150	19,100	9,750	6,600	68,400		10,900	2,470	2,470	2,470	2,040
12	6,600	5,150	16,500	9,370	5,700	50,900		9,370	2,290	2,200	2,470	1,670
13	5,990	4,890	15,300	8,270	5,150	44,100		9,000	2,200	2,120	3,060	1,550
14	5,420	4,640	15,300	8,270	5,150	44,600		8,630	2,290	1,960	3,060	1,440
15	5,150	4,640	34,500	8,630	4,890	40,000		7,920	2,040	2,660	2,660	1,380
16	4,890	4,390	42,500	7,920	6,290	34,000		7,580	1,880	3,700	3,270	1,330
17	4,640	6,920	37,400	6,000	12,500	32,000		6,600	1,880	5,700	2,860	1,330
18	4,640	16,100	29,600	4,800	35,400	30,100		5,990	1,960	6,600	3,060	1,380
19	4,150	19,100	23,600	4,400	24,000	26,800		5,420	1,880	6,600	2,470	1,380
20	3,920	17,000	18,700	4,000	18,700	23,600		5,150	1,810	6,600	2,290	1,380
21	3,920	15,300	15,300	3,800	14,900	21,800		4,890	1,810	5,150	2,290	1,810
22	3,700	13,300	13,700	4,200	12,100	22,200		4,390	1,740	4,150	2,660	2,200
23	3,480	16,500	13,700	7,500	10,100	23,200		4,150	1,670	5,150	2,860	2,470
24	3,270	29,100	15,700	13,000	9,000	21,400		4,150	1,610	4,890	2,660	2,470
25	3,060	38,400	15,300	12,000	8,630	21,400		3,920	1,550	4,390	2,290	2,660
26	3,060	33,000	14,500	9,000	7,580	21,400		4,390	1,500	3,480	2,120	2,290
27	3,060	27,700	13,300	6,500	7,250	22,200		4,390	1,440	3,060	2,040	2,290
28	3,920	23,200	10,500	5,700	9,000	23,600		4,390	1,500	2,470	1,810	2,290
29	4,890	21,400	9,060	5,700	-------	22,200		4,390	1,550	2,290	1,740	2,040
30	6,600	20,000	9,000	7,500	-------	21,800		4,640	1,500	2,120	1,670	1,960
31	6,920	-------	10,100	8,000	-------	20,000		4,640	-------	2,040	1,550	-------

NOTE—Discharge Jan. 17 to Feb. 4 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for North Branch Susquehanna River at Towanda and Danville. Discharge Apr. 5 to May 4 estimated, because of unsatisfactory gage height record, from discharge of North Branch Susquehanna River at Towanda and Danville. Braced figures show mean discharge for periods included.

Monthly discharge of North Branch Susquehanna River at Wilkes-Barre, for the year ending Sept. 30, 1921

(Drainage area 9,960 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	40,500	3,060	10,100	1.01	1.16
November	38,400	4,390	13,200	1.33	1.48
December	52,600	9,000	24,200	2.43	2.80
January	16,100	3,800	8,950	.899	1.04
February	35,400	4,890	9,670	.971	1.01
March	80,700	16,100	35,500	3.56	4.10
April	45,000*	8,000*	16,900	1.70	1.90
May	25,200*	3,920	10,500	1.05	1.21
June	5,150	1,440	2,430	.244	.27
July	6,600	1,500	3,140	.315	.36
August	3,700	1,550	2,560	.257	.30
September	2,660	1,330	1,850	.186	.21
The year	80,700	1,330	11,600	1.16	15.84

* Discharge estimated.

WAPWALLOPEN CREEK NEAR WAPWALLOPEN

Location.—At single-span steel highway bridge, known as Hart's Bridge, three and one-half miles southeast of Wapwallopen, Luzerne County, and three and one-half miles above mouth of creek.

Drainage Area.—46 square miles.

Records Available.—October 24, 1919, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Calvin P. Readler.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Left bank is high and not subject to overflow; right is of medium height and becomes inundated during extremely high stages. Bed is composed of gravel and boulders. Control is at a riffle about 1,000 feet below gage, where bed is composed of a compact formation of coarse gravel and boulders; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 4.2 feet at 9 p. m. March 3 (discharge, about 580 second-feet); minimum, 0.90 foot at 6 p. m. July 26 and several times in September (discharge, 5 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Regulation.—The operation of grist mills above the station may cause variation in stage during low flows. There is very little storage at the mill dam one and one-half miles above the gage; at the dam three and one-half miles above the gage there is some storage and flow during part of day, at time of low water, can probably be stored.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined between 15 and 300 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for extreme stages when they are fair.

Cooperation.—Station is maintained in cooperation with M. O. Leighton, Consulting Engineer, Washington, D. C.

The following discharge measurement was made by H. J. McIntyre: No. 12, May 12: Gage height, 1.80 feet; discharge, 67.6 second-feet.

Daily Mean Gage Height, in feet, of Wapwallopen Creek near Wapwallopen, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.79	1.44	2.56	1.68	1.69	2.65	1.84	2.84	1.28	1.17	1.08	0.91
2	2.21	1.39	2.61	1.65	1.63	2.72	1.79	2.61	1.27	1.14	1.22	.91
3	1.96	2.35	2.44	1.68	1.55	3.65	1.73	2.40	1.25	1.07	1.56	1.04
4	1.72	2.31	2.38	1.62	1.50	3.45	1.68	2.39	1.89	1.10	1.35	.96
5	1.61	2.04	2.29	1.60	1.71	2.76	1.66	2.66	1.44	1.02	1.32	1.03
6	1.56	1.70	2.26	1.55	1.92	2.69	1.63	2.29	1.37	.99	1.29	1.01
7	1.55	1.65	2.15	1.59	1.71	2.78	1.58	2.15	1.29	.99	1.26	.96
8	1.52	1.60	2.01	1.63	1.59	2.76	1.61	2.05	1.26	1.03	2.22	.95
9	1.43	1.56	1.92	1.64	1.57	2.81	1.64	1.95	1.24	1.01	1.67	.98
10	1.37	1.63	1.86	1.64	1.58	2.96	1.59	1.90	1.21	.95	1.44	.98
11	1.39	1.57	1.82	1.46	1.59	2.79	1.56	1.87	1.24	1.06	1.37	1.17
12	1.37	1.46	1.72	1.45	1.56	2.74	1.54	1.88	1.38	1.09	1.35	1.22
13	1.35	1.48	1.70	1.54	1.55	2.61	1.51	2.18	1.22	1.05	1.53	1.20
14	1.33	1.44	2.81	1.90	1.50	2.37	1.49	1.95	1.10	1.07	1.42	-------
15	1.30	1.46	2.54	1.80	1.72	2.28	1.52	1.92	1.17	1.08	1.33	-------
16	1.26	1.44	2.19	1.58	1.96	2.34	1.57	1.78	1.09	1.11	1.27	1.24
17	1.19	2.62	2.12	1.54	1.91	2.21	1.83	1.63	1.06	1.09	1.25	1.18
18	1.27	2.20	2.02	1.70	1.80	2.17	1.63	1.59	1.10	1.03	1.35	1.05
19	1.24	1.99	1.98	1.54	1.73	2.05	1.67	1.56	1.10	1.07	1.28	1.01
20	1.17	1.92	1.90	1.65	2.16	2.01	1.67	1.51	1.08	1.52	1.22	.99
21	1.20	1.86	1.86	1.60	2.71	2.00	1.64	1.48	1.03	1.36	1.16	1.34
22	1.11	1.78	1.78	1.72	2.63	1.95	1.61	1.45	1.02	1.24	1.10	1.47
23	1.04	1.69	2.40	1.68	2.04	1.85	2.68	1.80	1.05	1.15	1.05	1.31
24	1.10	1.86	2.03	1.54	1.68	1.93	2.83	1.60	1.03	.95	1.03	1.26
25	1.18	1.96	1.83	1.52	2.01	2.21	2.38	1.55	1.02	.95	.99	1.33
26	1.16	2.04	1.97	1.48	2.12	1.98	2.25	1.62	1.01	.91	.99	1.47
27	1.27	1.98	1.86	1.42	1.97	1.92	2.11	1.57	1.05	.95	1.04	1.16
28	2.21	1.95	1.79	1.46	2.66	1.86	2.00	1.51	1.21	.95	1.01	.96
29	1.69	1.88	2.12	1.40	-------	1.85	1.94	1.54	2.07	1.59	1.05	.95
30	1.56	1.84	1.84	1.40	-------	1.78	2.08	1.84	1.39	1.37	1.00	.91
31	1.47	-------	1.64	1.98	-------	1.76	-------	1.41	-------	1.21	.93	-------

NOTE—Stage-discharge relation Dec. 29 and 30; Jan. 7, 9-15 and 17-21; Feb. 2, 20-22 and 25-27 affected by ice. Gage height Sept. 14 and 15 not observed.

Daily discharge, in second-feet, of Wapwallopen Creek near Wapwallopen, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	221	36	176	58	59	193	76	230	23	16	12	6
2	122	31	184	55	46	202	70	184	22	15	19	6
3	90	144	159	58	46	400	63	151	21	11	46	10
4	62	136	151	52	41	350	58	151	82	12	28	7
5	51	102	136	50	61	212	56	193	36	9	26	10
6	46	60	129	46	85	202	53	136	30	8	23	9
7	46	55	115	46	61	221	48	115	23	8	22	7
8	43	50	95	53	49	212	51	102	22	10	122	7
9	35	46	85	46	47	221	54	89	20	9	57	8
10	30	53	78	40	48	250	49	83	19	7	36	8
11	31	47	73	32	49	221	46	79	20	11	30	16
12	30	37	62	28	46	212	45	81	30	12	28	19
13	28	39	60	28	46	184	42	122	19	10	44	18
14	26	36	221	32	41	144	40	89	12	11	34	18
15	24	37	176	46	62	136	43	85	16	12	26	20
16	22	36	122	48	90	144	47	69	12	13	22	20
17	17	184	108	36	84	122	75	53	11	12	21	17
18	22	122	95	32	71	115	53	49	12	10	28	10
19	20	94	93	28	63	102	57	46	12	11	23	9
20	16	85	83	28	36	95	57	42	12	43	19	8
21	18	78	78	40	50	95	54	39	10	29	16	27
22	13	69	69	62	75	89	51	36	9	20	12	38
23	10	59	151	58	102	77	202	71	10	15	10	25
24	12	78	102	45	58	87	230	50	10	7	10	22
25	17	90	75	43	40	122	151	46	9	7	8	26
26	16	102	91	39	50	93	129	52	9	6	8	38
27	22	93	78	34	70	85	108	47	10	7	10	16
28	122	89	70	37	193	78	95	42	19	7	9	7
29	59	81	55	32	-------	77	88	45	102	49	10	7
30	46	76	65	32	-------	69	108	76	31	30	8	6
31	38	-------	54	93	-------	67	-------	33	-------	19	6	-------

NOTE—Discharge Dec. 29 and 30; Jan. 7, 9-15 and 17-21; Feb. 2, 20-22 and 25-27 estimated. because of ice, from weather records, study of gage height graph and comparison with similar studies for Fishing Creek at Bloomsburg. Discharge Sept. 14 and 15 estimated, because of no gage height record, from comparison of hydrograph with records for adjacent drainage basins.

Monthly discharge of Wapwallopen Creek near Wapwallopen, for the year ending Sept. 30, 1921

(Drainage area 46 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	221	10	43.7	0.950	1.10
November	184	31	74.8	1.63	1.82
December	221	54	106	2.30	2.65
January	93	28	43.8	.952	1.10
February	193	36	63.2	1.37	1.43
March	400	67	157	3.41	3.93
April	230	40	76.6	1.67	1.86
May	230	33	86.6	1.88	2.17
June	102	9	22.4	.487	.54
July	49	6	14.4	.313	.36
August	122	6	24.9	.541	.62
September	38	6	14.8	.322	.36
The year	400	6	60.9	1.32	17.94

SUSQUEHANNA BASIN—STATION NO. 10

NESCOPECK CREEK NEAR ST. JOHNS

Location.—At single-span steel highway bridge, the first above the Wilkes-Barre & Hazleton Railway bridge, near St. Johns, Luzerne County.

Drainage Area.—49 square miles.

Records Available.—July 13, 1916, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Mrs. Edwin Sterling. Elevation of gage zero 1,116.47 feet. United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and boulders. Control consists of boulders 50 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 4.10 feet observed at 7 a. m. March 4 and 5 (discharge, 605 second-feet); minimum, 1.19 feet at 5.30 p. m. September 11 (discharge, 11 second-feet).

Ice.—Stage-discharge relation seriously affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined below 100 second-feet and fairly well defined between 100 and 500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for medium and high stages when they are fair.

The following discharge measurement was made by H. J. McIntyre: No. 20, May 12: Gage height, 2.06 feet; discharge, 85.2 second-feet.

Daily Mean Gage Height, in feet, of Nescopeck Creek near St. Johns, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.10	1.76	------	2.02	2.29	2.78	2.24	2.96	1.78	1.68	1.78	1.32
2	------	1.80	------	2.07	2.26	2.92	2.21	3.00	1.72	1.57	1.81	1.30
3	------	2.71	------	2.14	2.23	3.78	2.10	2.92	1.62	1.51	2.36	1.28
4	1.96	2.48	------	2.14	2.22	4.05	2.17	2.70	2.46	1.42	2.22	1.25
5	1.92	2.28	2.54	2.08	2.18	4.08	2.10	2.88	2.32	1.38	2.11	1.23
6	1.89	2.09	2.80	1.95	2.12	3.88	2.02	2.76	2.26	1.30	1.85	1.30
7	1.82	2.08	2 49	1.88	2.04	3.22	2.02	2.58	2.22	1.22	1.78	1.26
8	1.66	2.06	2.43	1.82	1.90	3.46	2.00	2.50	2.10	1.38	2.56	1.24
9	1.60	2.03	2.38	1.82	1.83	3.35	1.97	2.46	1.93	1.34	2.23	1.22
10	1.56	1.99	2.33	1.93	1.77	3.22	1.94	2.36	1.72	1.54	2.09	1.20
11	1.50	1.98	2.30	1.86	1.80	3.20	1.90	2.28	1.67	1.83	2.04	1.20
12	1.47	1.96	2.28	1.84	1.81	3.17	1.37	2.17	1.62	2.35	1.98	1.34
13	1.48	1.94	2.26	1.78	1.84	3.05	1.86	2.57	1.66	1.85	1.93	1.35
14	1.54	1.88	2.32	1.84	1.81	2.94	1.89	2.51	1.63	1.64	1.94	1.32
15	1.52	1.80	2.67	1.96	1.87	2.78	1.93	2.37	1.58	2.33	1.92	1.30
16	1.50	1.67	2.88	2.45	2.10	2.72	2.02	2.21	1.54	2.39	1.88	1.28
17	1.48	2.60	2.94	2.80	2.46	2.67	2.09	2.06	1.51	2.00	1.78	1.37
18	1.46	2.99	2.92	2.82	2.44	2.62	2.14	2.00	1.54	1.65	1.75	1.36
19	1.44	2.77	2.83	2.88	2.41	2.56	2.04	1.98	1.48	1.61	1.66	1.29
20	1.44	2.45	2.69	2.99	2.38	2.48	1.97	1.90	1.45	1.63	1.52	1.26
21	1.44	2.40	2.30	3.29	2.33	2.38	1.96	1.87	1.44	1.58	1.61	1.98
22	1.42	2.55	2.19	2.11	2.30	2.34	1.96	1.86	1.42	1.52	1.54	2.32
23	1.40	2.60	2.16	2.11	2.22	2.30	2.28	1.82	1.42	1.49	1.45	1.92
24	1.37	2.65	2.24	2.14	2.20	2.40	3.44	2.10	1.40	1.68	1.39	1.44
25	1.34	2.64	2.27	2.60	2.20	2.69	3.18	2.18	1.36	1.62	1.36	1.35
26	1.36	2.61	2.30	3.24	2.14	2.62	2.50	1.99	1.32	1.59	1.32	1.32
27	1.36	2.57	2.34	3.30	2.04	2.59	2.42	1.96	1.24	1.55	1.32	1.28
28	2.42	2.49	2.31	3.38	2.54	2.56	2.32	1.94	1.24	1.39	1.31	1.26
29	2.51	2.38	2.30	3.68	------	2.52	2.30	1.91	1.94	2.19	1.34	1.31
30	2.41	2.34	2.23	3.52	------	2.42	2.32	1.87	2.08	2.01	1.32	1.39
31	2.18	------	2.08	2.63	------	2.29	------	1.80	------	1.79	1.35	------

NOTE—Gage height Oct. 2, 3 and Dec. 1-4 unsatisfactory. Stage-discharge relation Jan. 10-22, Jan. 24 to Feb. 6, Feb. 11-14 and 17-27 affected by ice.

Daily discharge, in second-feet, of Nescopeck Creek near St. Johns, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	308	47	200	81	90	236	123	271	50	38	50	15
2	236	52	420	89	50	259	114	283	42	29	53	14
3	132	214	440	106	40	505	97	259	33	25	142	13
4	75	171	280	106	50	570	106	214	161	20	114	12
5	69	132	182	97	80	605	97	259	132	18	97	12
6	65	97	236	74	90	535	81	225	123	14	59	14
7	55	97	171	63	89	334	81	192	114	12	50	13
8	36	89	161	55	66	415	81	171	97	18	182	12
9	31	89	151	55	56	387	76	161	70	16	123	12
10	28	80	142	42	48	334	72	142	42	27	97	11
11	24	78	132	36	44	334	66	132	37	56	89	11
12	22	75	132	32	42	334	62	106	33	142	78	16
13	23	72	123	32	42	283	60	182	36	59	70	16
14	27	63	132	36	40	271	63	171	34	35	72	15
15	25	52	203	48	62	236	70	142	30	142	69	14
16	24	37	259	50	97	214	81	114	27	151	63	13
17	23	192	271	44	120	203	97	89	25	81	50	18
18	22	283	259	34	120	192	106	81	27	36	46	17
19	21	225	248	32	65	182	89	78	23	32	36	14
20	21	161	214	36	40	171	76	66	22	34	25	13
21	21	151	132	46	50	151	75	62	21	30	32	78
22	20	182	114	65	90	142	75	60	20	25	27	132
23	19	192	106	97	110	132	132	55	20	24	22	69
24	18	203	123	95	65	151	387	97	19	38	18	21
25	16	203	123	65	44	214	334	114	17	33	17	16
26	17	192	132	48	50	192	171	80	15	30	15	15
27	17	182	142	44	65	192	151	75	12	28	15	13
28	151	171	132	40	182	182	132	72	12	18	14	13
29	171	151	132	40	------	171	132	68	72	114	16	14
30	151	142	123	60	------	151	132	62	97	81	15	18
31	114	------	97	95	------	132	------	52	------	51	16	------

NOTE—Discharge Oct. 2,3 and Dec. 1-4 estimated, because of unsatisfactory gage height record, from discharge of Fishing Creek at Bloomsburg. Discharge Jan. 10-22, Jan. 24 to Feb. 6, Feb. 11-14 and 17-27 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Wapwallopen Creek near Wapwallopen.

Monthly discharge of Nescopeck Creek near St. Johns, for the year ending Sept. 30, 1921

(Drainage area 49 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	308	16	63.9	1.30	1.50
November	283	37	136	2.78	3.10
December	440	97	184	3.76	4.34
January	106	32	59.5	1.21	1.40
February	182	40	71.0	1.45	1.51
March	605	132	271	5.53	6.38
April	387	60	114	2.33	2.60
May	283	52	133	2.71	3.12
June	161	12	48.8	.996	1.11
July	151	12	47.0	.959	1.11
August	142	14	57.2	1.17	1.35
September	132	11	22.1	.451	.50
The year	605	11	101	2.06	28.02

SUSQUEHANNA BASIN—STATION NO. 11

FISHING CREEK AT BLOOMSBURG

Location.—At single-span, wooden covered, highway bridge, known as Red Rock Bridge, Bloomsburg, Columbia County.

Drainage Area.—355 square miles.

Records Available.—January 27, 1914, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by L. Norman Cox.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of sand and gravel. Control is at a riffle, where the bed is composed of gravel, about 700 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 10.5 feet at midnight December 14-15 (discharge, about 10,000 second-feet); minimum 2.03 feet at 6.45 a. m. June 28 (discharge, 40 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined below 600 second-feet and fairly well defined between 600 and 2,200 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for medium and high stages when they are fair.

The following discharge measurement was made by H. J. McIntyre: No. 18, May 13: Gage height, 4.20 feet; discharge, 900 second-feet.

Daily Mean Gage Height, in feet, of Fishing Creek at Bloomsburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.88	2.80	4.31	3.45	3.66	5.54	4.35	5.23	2.97	2.52	2.50	2.47
2	4.61	2.88	5.83	3.52	3.38	5.29	4.06	5.05	2.88	2.41	2.80	2.55
3	3.98	4.60	5.80	3.77	3.30	6.31	3.99	4.70	2.81	2.40	3.09	2.42
4	3.71	4.00	4.90	3.50	3.25	6.21	3.89	4.48	3.70	2.45	3.20	3.06
5	3.44	3.67	4.28	3.40	3.21	5.54	3.79	4.81	2.78	2.45	2.56	2.70
6	3.21	3.45	4.90	3.56	3.53	4.87	3.69	4.55	3.06	2.49	2.61	2.63
7	3.16	3.28	4.48	3.28	3.60	5.10	3.60	4.35	2.94	2.51	2.84	3.49
8	3.02	3.29	4.30	3.40	3.36	5.78	3.54	4.12	3.14	2.41	4.25	2.95
9	3.00	3.20	4 12	3.35	3.35	6.62	3.65	3.88	2.75	2.32	3.34	2.71
10	3.02	3.24	3.92	3.16	3.36	7.71	3.56	3.73	2.75	2.56	3.20	2.63
11	2.83	3.19	3.86	3.08	3.44	6.15	3.52	3.58	2.65	2.52	2.98	2.59
12	2.80	3.09	3.66	3.26	3.36	5.41	3.36	3.51	2.96	2.48	3.04	2.75
13	2.82	2.99	3.56	2.95	3.22	5.18	3.35	4.12	2.58	2.52	3.22	2.68
14	2.74	2.94	6.00	3.00	3.26	4.85	3.25	4.08	2.60	2.30	3.23	2.66
15	2.76	2.86	8.47	3.21	3.40	4.75	3.25	3.90	2.39	2.76	3.10	2.61
16	2.64	2.94	6.00	3.28	3.86	4.94	3.33	3.76	2.50	3.02	2.97	2.55
17	2.68	4.63	5.30	3.25	4.70	4.81	3.60	3.66	2.46	2.78	2.84	2.57
18	2.69	4.95	4.75	3.04	4.34	4.72	3.85	3.51	2.45	2.52	3.10	2.62
19	2.52	4.44	4.36	3.03	3.85	4.41	3.70	3.39	2.30	2.49	3.39	2.62
20	2.48	4.16	4.10	2.96	3.55	4.20	3.61	3.33	2.49	3.11	3.09	2.65
21	2.50	3.84	3.76	3.17	3.65	4.10	3.51	3.20	2.19	2.78	3.00	2.87
22	2.50	3.75	3.83	4.27	3.69	3.96	3.47	3.18	2.41	2.42	2.73	5.25
23	2.44	4.60	4.75	4.18	3.55	3.79	5.65	3.35	2.18	2.36	2.86	4.12
24	2.36	4.92	4.40	3.92	3.50	3.83	7.67	3.35	2.16	2.40	2.76	3.59
25	2.53	4.76	4.15	3.39	3.15	5.20	5.86	3.16	2.12	2.30	2.72	3.72
26	2.40	4.42	3.86	3.34	3.22	5.06	5.08	3.18	2.30	2.18	2.73	3.45
27	2.53	4.30	3.92	3.35	3 34	4.85	4.58	3.06	2.38	2.55	2.66	3.21
28	3.12	4.12	3.86	3.31	4.50	4.51	4.26	2.99	2.34	2.45	2.75	3.08
29	3.08	3.95	3.45	3.26	-------	4.42	4.06	3.52	2.76	2.38	2.64	2.97
30	2.78	3.72	3.59	3.31	-------	4.16	4.12	3.22	[illegible]	3.15	2.61	2.95
31	2.87	-------	3.46	4.28	-------	4 03	-------	3.14	-------	2.70	2.52	-------

Daily discharge, in second-feet, of Fishing Creek at Bloomsburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,510	175	1,010	440	560	2,080	1,050	1,780	221	112	108	103
2	1,250	195	2,400	470	400	1,880	825	1,600	195	92	175	118
3	790	1,250	2,400	620	360	2,900	790	1,330	178	90	266	94
4	590	790	1,510	475	335	2,870	720	1,170	590	99	310	254
5	434	560	1,010	410	315	2,080	650	1,420	170	99	120	150
6	315	440	1,510	490	500	1,510	590	1,250	254	106	130	135
7	294	350	1,170	350	530	1,690	530	1,050	212	110	185	464
8	238	355	1,010	410	390	2,400	500	860	286	92	970	215
9	230	310	860	385	385	3,370	560	720	162	77	380	152
10	238	330	720	294	390	4,920	500	620	162	120	310	135
11	182	306	685	262	434	2,870	470	530	139	112	224	126
12	175	266	560	340	390	1,980	390	470	218	104	246	162
13	180	227	500	215	320	1,780	385	860	124	112	320	146
14	160	212	2,630	230	340	1,420	335	860	128	74	325	141
15	165	190	6,200	315	410	1,420	335	720	88	165	270	130
16	137	212	2,630	350	685	1,510	375	620	108	238	221	118
17	146	1,250	1,880	335	1,330	1,420	530	560	101	170	185	122
18	148	1,600	1,420	246	1,050	1,330	685	470	99	112	270	132
19	112	1,130	1,050	242	685	1,090	590	405	74	106	405	132
20	104	895	860	218	500	930	530	375	106	274	266	139
21	108	685	620	298	560	860	470	310	59	170	230	192
22	108	620	685	970	590	755	452	302	92	94	158	1,780
23	97	1,250	1,420	930	500	650	2,180	385	58	84	190	860
24	84	1,510	1,090	720	470	685	4,920	385	55	90	165	530
25	114	1,420	895	405	290	1,880	2,510	294	50	74	155	590
26	90	1,090	685	380	320	1,690	1,690	302	74	58	158	440
27	114	1,010	720	385	380	1,420	1,250	254	87	118	141	315
28	278	860	685	380	1,170	1,170	970	227	80	99	162	262
29	262	755	440	340	-------	1,090	825	470	165	87	137	221
30	170	590	530	365	-------	895	860	320	80	290	130	215
31	192	-------	446	1,010	-------	825	-------	286	-------	150	112	-------

Monthly discharge of Fishing Creek at Bloomsburg, for the year ending Sept. 30, 1921

(Drainage area 355 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	2,510	84	323	0.910	1.05
November	1,600	175	694	1.95	2.18
December	6,200	440	1,300	3.66	4.22
January	1,010	215	425	1.20	1.38
February	1,330	290	521	1.47	1.53
March	4,920	650	1,720	4.85	5.59
April	4,920	335	916	2.58	2.88
May	1,780	227	684	1.93	2.22
June	590	50	147	.414	.46
July	290	58	122	.344	.40
August	970	108	239	.673	.78
September	1,780	94	286	.806	.90
The year	6,200	50	617	1.74	23.59

SUSQUEHANNA BASIN—STATION NO. 12

NORTH BRANCH SUSQUEHANNA RIVER AT DANVILLE

Location.—At seven-span steel highway bridge between South Danville and Danville, Montour County.

Drainage Area.—11,200 square miles.

Records Available.—March 25, 1899, to December 31, 1903, and March 23, 1905, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by E. F. Bell. Elevation of gage zero 430.47 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Left bank is high and not subject to overflow; right bank subject to overflow at extremely high stages. Bed is composed of gravel and rock. Control is at a riffle a short distance below the gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, 15.5 feet observed at 6 p. m. March 10 (discharge, 101,000 second-feet); minimum, 2.2 feet on June 28 and at 7 a. m. September 21 (discharge, 1,810 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 800 and 150,000 second-feet. Gage read to tenths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of North Branch Susquehanna River at Danville, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
62	May 14	O. W. Hartwell and H. J. McIntyre	4.73	12,300
63	June 21	H. J. McIntyre	2.47	2,360

Daily Mean Gage Height, in feet, of North Branch Susquehanna River at Danville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.05	3.95	6.85	4.6	4.1	5.55	6.7	6.1	3.45	2.4	2.65	2.35
2	10.1	3.95	8.7	4.6	3.8	7.95	6.95	6.8	3.55	2.4	2.8	2.3
3	9.85	4.15	11.75	4.7	3.65	10.3	7.7	7.7	3.35	2.6	3.4	2.3
4	8.8	4.8	12.2	4.95	3.5	12.25	7.6	7.7	3.5	2.6	3.25	2.3
5	7.35	4.3	11.1	5.75	3.6	12.35	6.95	7.4	3.25	2.5	3.05	2.45
6	6.15	4.2	9.95	5.65	3.9	10.55	6.35	6.85	3.1	2.45	2.9	2.3
7	5.4	4.2	9.25	5.3	4.15	9.6	5.9	7.05	3.0	2.4	2.8	2.6
8	5.0	4.05	9.1	5.4	4.2	11.7	5.6	7.1	3.0	2.4	3.3	2.75
9	4.65	3.85	8.7	5.25	4.2	13.65	5.35	6.4	3.0	2.4	3.2	2.65
10	4.45	3.7	7.7	4.95	4.2	15.00	5.15	5.7	2.9	2.3	3.0	2.55
11	4.15	3.6	6.75	4.65	4.1	14.65	5.0	5.25	2.8	2.65	2.95	2.55
12	3.95	3.5	6.2	4.45	3.95	12.75	4.95	4.95	2.8	2.8	2.85	2.5
13	3.8	3.5	5.85	4.4	3.65	10.8	4.75	4.8	2.7	2.75	2.85	2.5
14	3.7	3.45	6.15	4.2	3.6	10.35	4.55	4.7	2.65	2.55	3.1	2.5
15	3.6	3.4	9.65	4.4	3.9	10.7	4.4	4.55	2.6	2.6	2.95	2.35
16	3.5	3.4	10.85	4.5	3.9	9.65	4.3	4.35	2.6	3.0	2.85	2.3
17	3.4	3.65	10.35	4.35	4.3	9.0	4.45	4.15	2.55	3.0	3.0	2.3
18	3.3	5.0	9.25	4.45	7.75	8.65	4.85	4.05	2.55	3.05	3.1	2.35
19	3.3	6.45	7.95	4.2	8.6	8.1	4.7	3.85	2.5	4.0	3.0	2.3
20	3.2	6.55	6.95	3.3	7.2	7.65	4.85	3.6	2.5	4.35	2.85	2.3
21	3.2	5.9	6.2	3.05	6.2	7.2	5.1	3.6	2.4	4.0	2.75	2.3
22	3.1	5.55	5.75	3.9	5.4	6.95	5.15	3.5	2.4	3.65	2.7	3.1
23	3.1	5.7	5.7	4.35	4.95	7.2	5.5	3.5	2.4	3.4	2.8	3.1
24	3.05	7.3	5.8	4.7	4.65	7.05	8.2	3.45	2.4	3.5	2.85	2.85
25	3.0	9.9	5.9	4.8	4.45	7.0	10.6	3.3	2.4	3.5	2.75	2.8
26	2.9	9.6	6.25	4.5	4.35	7.35	9.45	3.4	2.3	3.25	2.7	2.9
27	2.8	8.45	5.6	4.05	4.1	7.05	8.2	3.45	2.3	3.05	2.6	2.8
28	3.15	7.6	5.25	3.75	4.4	7.35	7.1	3.45	2.2	2.95	2.5	2.7
29	3.3	7.05	4.95	3.65	------	7.3	6.35	3.45	2.55	2.85	2.5	2.6
30	3.5	6.7	4.65	3.6	------	7.15	5.85	3.55	2.5	2.9	2.5	2.5
31	3.9	------	4.6	4.15	------	6.95	------	3.5	------	2.8	2.4	------

NOTE—Stage-discharge relation Jan. 18-20 affected by ice.

Daily discharge, in second-feet, of North Branch Susquehanna River at Danville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23,600	7,870	22,400	10,700	8,320	15,600	21,800	18,300	5,380	2,270	2,940	2,150
2	46,600	7,870	35,400	10,700	7,000	30,300	23,600	22,400	6,170	2,270	3,370	2,030
3	44,100	8,780	61,700	11,200	6,170	48,400	28,200	28,200	5,380	2,800	5,380	2,030
4	36,100	11,600	65,500	12,600	5,770	65,500	27,500	28,200	5,770	2,800	4,640	2,030
5	26,200	9,250	55,400	16,700	6,170	67,400	23,600	26,200	4,640	2,530	3,980	2,400
6	18,900	8,780	45,800	15,600	7,430	51,000	20,000	22,400	4,300	2,400	3,670	2,030
7	14,600	8,780	39,200	14,100	8,780	42,500	17,200	23,600	3,980	2,270	3,370	2,800
8	12,600	7,870	38,400	14,600	8,780	60,800	15,600	24,200	3,980	2,270	5,000	3,220
9	10,700	7,000	35,400	13,600	8,780	79,800	14,600	20,000	3,980	2,270	4,640	2,940
10	9,730	6,580	28,200	12,600	8,780	95,300	13,600	16,100	3,670	2,030	3,980	2,660
11	8,780	6,170	22,400	10,700	8,320	90,800	12,600	13,600	3,370	2,940	3,820	2,660
12	7,870	5,770	18,900	9,730	7,870	71,500	12,600	12,600	3,370	3,370	3,520	2,530
13	7,000	5,770	16,700	9,730	6,170	52,700	11,600	11,600	3,080	3,220	3,520	2,530
14	6,580	5,380	18,900	8,780	6,170	49,200	10,700	11,200	2,940	2,660	4,300	2,530
15	6,170	5,380	42,500	9,730	7,430	51,800	9,730	10,700	2,800	2,800	3,820	2,150
16	5,770	5,380	52,700	10,200	7,430	42,500	9,250	9,730	2,800	3,980	3,520	2,030
17	5,380	6,170	49,200	9,730	9,250	37,700	9,730	8,780	2,660	3,980	3,980	2,030
18	5,000	12,600	39,200	6,500	28,900	34,600	11,600	7,870	2,660	3,980	4,300	2,150
19	5,000	20,000	30,300	46,000	34,600	31,000	11,200	7,000	2,530	7,870	3,980	2,030
20	4,640	21,200	23,600	40,000	24,900	27,500	11,600	6,170	2,530	9,730	3,520	2,030
21	4,640	17,200	18,900	3,980	18,900	24,900	13,100	6,170	2,270	7,870	3,230	2,030
22	4,300	15,600	16,700	7,430	14,600	23,600	13,600	5,770	2,270	6,170	3,080	4,300
23	4,300	16,100	16,100	9,730	12,600	24,900	15,100	5,770	2,270	5,380	3,370	4,300
24	3,980	25,500	16,700	11,200	10,700	23,600	31,700	5,380	2,270	5,770	3,520	3,520
25	3,980	45,000	17,200	11,600	9,730	23,600	51,000	5,000	2,270	5,770	3,220	3,370
26	3,670	42,500	18,900	10,200	9,730	26,200	40,800	5,380	2,030	4,640	3,080	3,670
27	3,370	33,200	15,600	7,870	8,320	23,600	31,700	5,380	2,030	3,980	2,800	3,370
28	4,640	27,500	13,600	7,000	9,730	26,200	24,200	5,380	1,810	3,820	2,530	3,080
29	5,000	23,600	12,600	6,170	-------	25,500	20,000	5,380	2,660	3,520	2,530	2,800
30	5,770	21,800	10,700	6,170	-------	24,900	16,700	6,170	2,530	3,670	2,530	2,530
31	7,430	-------	10,700	8,780	-------	23,600	-------	5,770	-------	3,370	2,270	-------

NOTE—Discharge Jan. 18-20 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for North Branch Susquehanna River at Wilkes-Barre.

Monthly discharge of North Branch Susquehanna River at Danville, for the year ending Sept. 30, 1921

(Drainage area 11,200 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	46,600	3,370	11,500	1.03	1.19
November	45,000	5,380	14,900	1.33	1.48
December	65,500	10,700	29,300	2.62	3.02
January	16,700	3,980	9,880	.882	1.02
February	34,600	5,770	11,100	.991	1.03
March	95,300	15,600	42,500	3.79	4.37
April	51,000	9,250	19,100	1.71	1.91
May	28,200	5,000	12,600	1.12	1.29
June	6,170	1,810	3,280	.293	.33
July	9,730	2,030	3,950	.353	.41
August	5,380	2,270	3,590	.321	.37
September	4,300	2,030	2,660	.238	.27
The year	95,300	1,810	13,800	1.23	16.69

WEST BRANCH SUSQUEHANNA RIVER AT BOWER

Location.—At single-span steel highway bridge, about four miles northeast of Mahaffey, near railroad station at Bower, Clearfield County.

Drainage Area.—320 square miles.

Records Available.—October 2, 1913, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by A. T. Bell. Elevation of gage zero 1,207.22 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank is low and subject to overflow at extremely high stages; left is high and not subject to overflow. Bed is composed of gravel. Control is at a riffle about 200 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 11.5 feet at 4 a. m. August 8 (discharge, about 7,300 second-feet); minimum, 3.65 feet at 5.30 p. m. June 23 (discharge, 22 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 50 and 4,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for extreme stages when they are fair.

Discharge Measurements of West Branch Susquehanna River at Bower, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
25	Apr. 5	J. M. Snavely	5.15	298
26	5	J. M. Snavely	5.14	283
25	June 28*	H. L. Landis	4.27	68.4

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* Measurement made by wading 250 feet above gage.

Daily Mean Gage Height, in feet, of West Branch Susquehanna River at Bower, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.24	4.32	5.71	5.26	5.78	6.01	5.41	5.34	5.16	4.56	4.72	4.00
2	6.42	4.45	6.42	6.00	5.41	6.28	5.49	5.82	5.06	4.24	4.70	4.05
3	5.76	5.13	6.52	5.90	5.44	8.37	5.36	5.48	5.00	4.05	5.51	4.20
4	5.29	5.15	6.21	5.64	5.48	8.16	5.30	5.74	4.71	3.86	5.85	4.38
5	5.20	4.75	6.17	5.68	5.68	7.57	5.18	8.79	4.54	4.05	5.45	5.67
6	4.95	4.58	6.08	5.64	6.63	7.73	5.12	8.50	4.46	3.97	5.15	5.22
7	4.88	4.49	5.74	5.49	6.33	8.64	5.02	7.68	4.34	3.97	8.56	4.85
8	4.80	4.54	5.71	6.65	6.61	8.14	4.98	7.17	4.36	3.97	9.86	4.65
9	4.68	4.58	5.35	6.82	6.66	7.76	5.25	6.28	4.33	4.01	7.35	4.48
10	4.58	4.74	5.34	6.45	6.91	7.56	5.41	5.89	4.38	3.97	6.35	4.38
11	4.56	4.58	5.35	6.25	6.94	7.06	5.20	5.61	4.48	4.00	5.45	4.95
12	4.50	4.54	5.32	6.10	6.66	6.78	5.11	5.34	4.25	4.16	5.41	5.35
13	4.48	4.49	5.26	5.76	6.28	6.92	5.05	5.65	4.18	4.16	5.05	4.95
14	4.46	4.42	6.84	5.54	6.31	6.68	5.10	5.42	4.29	4.06	4.98	4.54
15	4.39	4.42	6.98	5.48	6.38	6.46	5.14	5.28	4.15	3.98	4.81	4.50
16	4.34	4.44	6.46	5.44	6.52	7.03	5.08	5.07	3.85	4.11	4.65	4.58
17	4.31	4.72	6.31	5.28	6.46	6.78	5.14	5.01	3.96	4.25	5.15	4.85
18	4.30	5.32	6.20	5.18	6.46	6.48	5.08	4.91	4.19	4.08	5.32	5.80
19	4.26	5.18	5.95	5.67	6.52	6.23	4.98	4.79	4.13	4.12	4.82	5.35
20	4.24	6.28	5.65	5.92	6.30	6.06	4.92	4.71	3.93	4.14	4.55	4.75
21	4.26	7.01	5.62	5.78	6.20	6.11	4.86	4.65	3.96	4.47	4.48	7.10
22	4.26	7.30	5.56	7.38	5.99	5.92	4.84	4.59	3.90	4.15	4.44	8.29
23	4.24	7.61	6.50	8.96	5.88	5.60	5.18	4.68	3.77	3.98	4.32	6.65
24	4.26	7.92	6.50	7.78	5.84	5.52	5.35	4.63	3.96	3.94	4.38	5.70
25	4.40	7.48	6.08	6.85	5.78	5.55	5.11	4.63	3.91	3.75	4.29	5.55
26	4.54	7.35	5.76	6.09	5.70	5.50	5.04	4.69	3.85	3.91	4.18	5.55
27	4.42	7.01	5.48	5.88	6.01	5.38	5.02	4.62	3.89	4.93	4.15	5.25
28	4.39	6.58	5.60	5.75	6.16	5.26	4.98	4.81	4.40	4.40	4.10	5.10
29	4.38	6.32	5.52	5.72	-------	5.41	5.24	5.40	4.89	5.67	4.02	4.85
30	4.32	5.77	5.46	5.61	-------	5.28	5.42	6.29	4.82	5.75	3.99	4.68
31	4.28	-------	5.30	6.38	-------	5.26	-------	5.76	-------	5.26	4.01	-------

NOTE—Stage-discharge relation Jan. 18-21 affected by ice.

Daily discharge, in second-feet, of West Branch Susquehanna River at Bower, for the year ending Sept. 30, 1921

Day	Oct	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	830	83	495	298	550	670	355	335	265	118	145	46
2	935	102	935	670	355	865	400	550	235	71	145	50
3	522	265	1,010	610	378	3,000	335	400	220	51	400	65
4	315	265	795	470	400	2,760	315	522	145	35	580	92
5	280	155	762	495	495	2,060	280	3,520	118	50	378	470
6	205	125	730	470	1,090	2,170	250	3,130	104	44	265	280
7	190	108	522	400	900	3,260	220	2,170	86	44	3,260	178
8	165	118	495	1,090	1,090	2,640	220	1,640	89	44	5,020	135
9	145	125	335	1,260	1,180	2,280	298	865	84	47	1,840	107
10	125	155	335	972	1,360	2,060	355	610	92	44	900	92
11	118	125	335	830	1,360	1,540	280	445	107	46	378	205
12	110	118	315	730	1,180	1,260	250	335	72	61	355	335
13	107	108	298	522	865	1,360	235	470	63	61	235	205
14	104	98	1,260	422	865	1,180	250	355	78	46	220	118
15	94	98	1,450	400	935	972	265	315	60	44	165	110
16	86	101	972	378	1,010	1,450	250	235	34	56	135	125
17	82	145	865	315	972	1,260	265	220	43	72	265	178
18	80	315	795	260	972	1,010	250	190	64	52	315	550
19	74	280	640	190	1,010	830	220	165	58	57	165	335
20	71	865	470	220	865	700	190	145	40	59	118	155
21	74	1,450	445	320	795	730	178	135	43	106	107	1,540
22	74	1,740	422	1,840	670	610	178	125	38	60	101	2,880
23	71	2,060	1,010	3,780	610	445	280	145	29	44	83	1,090
24	74	2,400	1,010	2,280	580	400	335	135	43	41	92	495
25	95	1,950	730	1,260	550	422	250	135	39	28	78	422
26	118	1,840	522	730	495	400	235	145	31	39	63	422
27	98	1,450	400	610	670	355	220	125	37	205	60	298
28	94	1,090	445	522	762	298	220	165	95	95	55	250
29	92	865	400	495	-------	355	298	355	190	470	48	178
30	83	522	378	445	-------	315	355	865	165	522	45	145
31	77	-------	315	935	-------	298	-------	522	-------	298	47	-------

NOTE—Discharge Jan. 18-21; estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Clearfield Creek at Dimeling.

Monthly discharge of West Branch Susquehanna River at Bower, for the year ending Sept. 30, 1921

(Drainage area 320 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	935	71	180	0.562	0.65
November	2,400	83	637	1.99	2.22
December	1,450	298	642	2.01	2.32
January	3,780	190	781	2.44	2.81
February	1,360	355	820	2.56	2.67
March	3,260	298	1,220	3.81	4.39
April	400	178	268	.838	.94
May	3,520	125	628	1.96	2.26
June	265	29	92.2	.288	.32
July	522	28	97.1	.303	.35
August	5,020	45	518	1.62	1.87
September	2,880	46	385	1.20	1.34
The year	5,020	28	522	1.63	22.14

SUSQUEHANNA BASIN—STATION NO. 14

WEST BRANCH SUSQUEHANNA RIVER AT CLEARFIELD

Location.—At two-span steel highway bridge, Market Street, Clearfield, Clearfield County.

Drainage Area.—487 square miles.

Records Available.—December 1, 1904, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to tenths twice daily by H. P. Bridge; during high stages more frequently. Elevation of gage zero 1,093.30 feet, United States Geological Survey datum.

Channel and Control.—Both banks are high and not subject to overflow. Control is a low dam about 2,000 feet below gage.

Extremes of Stage.—Maximum gage height during the year, 6.2 feet observed at 7 a. m. August 8; minimum, —0.05 foot several days in September.

Ice.—Stage-discharge relation usually affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

Daily Mean Gage Height, in feet, of West Branch Susquehanna River at Clearfield, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.55	1.2	2.5	0.9	1.45	1.45	0.95	1.0	1.4	0.45	2.42	0.0
2	3.4	1.25	2.95	.95	1.25	1.5	.95	1.05	1.05	.25	2.25	−.04
3	2.9	2.25	3.1	1.3	1.05	2.85	.95	1.2	.85	.12	2.62	−.05
4	2.65	2.15	2.8	1.3	.9	3.2	.9	1.2	.7	.08	2.95	−.05
5	2.45	1.95	2.7	1.2	.95	2.75	.76	3.15	.68	.0	2.65	.22
6	2.25	1.65	2.7	1.2	1.6	3.05	.7	3.8	.58	.2	2.41	1.02
7	2.1	1.5	2.55	1.1	1.65	3.3	.66	2.75	.48	.9	4.3	.68
8	2.0	1.45	2.35	1.6	1.5	3.95	.6	2.3	.38	.9	5.82	.46
9	2.0	1.4	2.2	2.4	1.85	3.15	.83	1.85	.29	1.0	4.05	.34
10	1.9	1.5	2.1	1.9	2.25	3.2	1.0	1.55	.21	1.6	3.28	.7
11	1.8	1.5	2.0	1.55	2.0	2.4	.92	1.25	.2	1.95	2.8	1.55
12	1.7	1.45	2.0	1.45	1.95	2.0	.82	1.1	.28	2.15	2.2	1.39
13	1.6	1.4	2.0	1.25	1.7	2.4	.76	1.1	.26	2.0	1.4	1.0
14	1.6	1.15	2.6	1.0	1.6	2.25	.7	1.05	.18	1.92	1.22	.75
15	1.6	1.2	3.65	1.0	1.75	2.0	.7	.84	.08	1.8	1.05	.5
16	1.55	1.35	3.1	1.0	1.8	2.3	.7	.71	.0	2.1	.55	.49
17	1.5	1.65	2.85	.8	2.75	2.4	.7	.59	.0	2.05	.35	1.38
18	1.5	2.3	2.65	.5	2.5	2.05	.7	.51	.0	1.92	.85	2.75
19	1.4	2.1	2.6	.6	2.0	1.85	.66	.46	.0	1.78	.68	2.25
20	.9	2.2	2.55	.55	1.9	1.7	.57	.41	−.1	2.0	.58	1.75
21	.6	3.45	2.45	.9	1.85	1.55	.49	.36	−.14	2.0	.5	3.42
22	.5	3.55	2.35	2.2	1.65	1.45	.46	.3	−.2	2.05	.46	5.02
23	.75	3.75	2.7	3.75	1.45	1.3	.67	.28	−.2	1.9	.39	3.7
24	.8	3.95	2.1	3.0	1.2	1.2	1.0	.2	−.2	1.78	.34	3.15
25	.9	3.75	1.55	2.4	.95	1.2	.85	.38	−.2	1.68	.3	2.7
26	1.15	3.55	1.1	1.9	.85	1.15	.69	.4	−.2	1.61	.25	2.35
27	1.1	3.35	1.25	1.5	1.05	1.0	.64	.36	.05	1.65	.21	2.15
28	1.4	3.05	1.25	1.3	1.25	.9	.62	.92	.0	2.35	.12	1.93
29	1.35	2.75	.95	1.2	-------	1.0	.75	1.65	.35	2.5	.1	1.78
30	1.3	2.55	.9	1.25	-------	.85	1.0	2.56	.65	3.32	.06	1.68
31	1.2	-------	.95	1.4	-------	.85	-------	2.08	-------	2.7	.02	-------

NOTE—Stage-discharge relation Jan. 19-22 affected by ice. Gage height July 6-11 was gradually raised about two feet by repairs to dam below gage and about two feet of backwater remained at station until Aug. 8, when the repair work was washed away by high water.

SUSQUEHANNA BASIN—STATION NO. 15

CLEARFIELD CREEK AT DIMELING

Location.—At a single-span steel highway bridge, Dimeling, Clearfield County, about 400 feet downstream from the mouth of Little Clearfield Creek.

Drainage Area.—370 square miles.

Records Available.—October 2, 1913, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by John Olson. Elevation of gage zero, 1,145.56 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Left bank is high and not subject to overflow; right is low and is overflowed at extremely high stages. Bed at control riffle, about 250 feet below gage, is composed of coarse gravel and boulders; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 10.6 feet at 4 a. m. August 8 (discharge, 6,940 second-feet); minimum, 3.60 feet at 7 a. m. November 21 and 4 p. m. July 9 (discharge, 48 second-feet).

Ice.—Stage-discharge relation seriously affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined below 1,000 second-feet; fairly well defined between 1,000 and 3,000 second-feet and well defined from 3,000 to 11,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for intermediate stages when they are fair.

Discharge Measurements of Clearfield Creek at Dimeling, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
27	Apr. 5	J. M. Snavely	4.92	354
28	June 28	H. J. McIntyre	4.60	262

Daily Mean Gage Height, in feet, of Clearfield Creek at Dimeling, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.96	3.65	5.95	4.79	5.35	5.62	5.10	5.20	4.85	4.35	5.00	3.81
2	5.90	4.00	6.38	5.22	5.05	6.05	5.22	5.74	4.68	4.28	4.86	3.78
3	5.62	4.70	6.48	5.28	5.02	8.20	5.05	5.52	4.58	4.12	6.30	3.81
4	5.25	-------	6.50	5.05	5.12	8.08	4.98	6.00	4.68	3.98	6.20	3.82
5	4.98	-------	6.15	5.10	5.29	7.35	4.94	9.64	4.42	3.88	5.42	4.63
6	4.75	-------	5.88	5.08	5.82	7.55	4.86	8.82	4.32	3.78	5.00	4.15
7	4.58	-------	5.55	5.03	5.68	8.31	4.79	7.36	4.24	3.80	7.43	4.02
8	4.57	-------	5.38	5.90	5.62	7.96	4.81	-------	4.15	3.72	9.52	3.95
9	4.44	-------	5.15	6.10	5.95	7.50	5.18	-------	4.04	3.62	7.05	4.15
10	4.40	-------	5.04	5.72	6.02	7.35	5.35	5.88	3.99	3.85	6.15	4.4[illegible]
11	4.28	-------	5.08	5.52	6.10	6.77	5.12	5.58	3.92	4.28	5.62	4.96
12	4.28	-------	5.02	5.42	5.84	6.45	5.05	5.37	4.05	4.28	5.30	5.11
13	4.32	-------	4.92	4.98	5.66	6.71	4.92	5.48	3.88	4.08	5.10	4.30
14	4.15	-------	5.72	4.98	5.62	6.53	4.89	5.34	3.79	3.95	5.02	4.09
15	4.06	-------	6.32	5.06	5.95	6.21	4.82	5.12	3.82	4.04	4.95	4.01
16	4.03	-------	5.95	4.98	6.40	6.40	4.90	4.82	3.84	3.92	4.72	3.92
17	4.02	5.00	5.82	4.88	7.35	-------	4.82	4.58	3.85	3.92	4.55	4.62
18	4.03	5.32	5.68	5.98	6.75	-------	4.72	4.52	3.93	3.84	4.54	4.98
19	4.04	5.06	5.44	6.78	6.08	-------	4.69	4.59	3.88	3.82	4.48	4.85
20	3.90	5.52	4.92	6.85	5.75	-------	4.58	4.58	3.84	3.78	4.36	4.73
21	3.98	6.72	4.72	6.97	5.35	5.58	4.45	4.35	3.79	4.28	4.22	6.38
22	3.85	6.90	4.56	7.29	5.58	5.50	4.42	4.27	3.74	4.02	4.12	7.32
23	3.98	7.75	4.68	7.99	5.40	5.28	5.00	4.35	3.69	3.84	4.02	6.25
24	3.85	7.89	4.92	-------	5.35	5.24	5.45	4.38	3.72	3.72	4.00	5.26
25	3.88	7.48	5.44	5.97	4.88	5.28	5.05	4.36	3.76	3.78	3.98	4.98
26	3.98	7.18	5.30	5.44	5.15	5.18	4.88	4.48	3.82	3.74	3.98	5.02
27	4.18	6.70	5.05	5.31	5.02	5.08	4.78	4.56	4.30	3.72	3.95	4.95
28	4.02	6.30	4.74	5.22	5.52	4.98	4.75	5.12	4.54	3.85	3.92	4.73
29	4.09	5.95	4.77	5.21	-------	4.98	5.08	5.38	4.81	6.35	3.86	4.48
30	4.08	5.61	4.92	5.22	-------	4.75	5.08	5.55	4.75	6.42	3.84	4.24
31	3.94	-------	4.94	5.35	-------	4.78	-------	5.06	-------	5.72	3.79	-------

NOTE—Gage height Nov. 4-16, Jan. 24, Mar. 17-20 and May 8 and 9 unsatisfactory. Stage-discharge relation Jan. 18-21 affected by ice.

Daily discharge, in second-feet, of Clearfield Creek at Dimeling, for the year ending Sept. 30, 1921

Day	Oct.	Nov	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,700	54	882	320	540	675	430	470	338	184	390	77
2	850	109	1,180	470	410	915	470	760	285	172	338	72
3	675	285	1,260	515	390	3,040	410	620	250	129	1,120	77
4	492	150	1,260	410	430	2,920	390	915	285	105	1,040	78
5	390		1,040	430	515	2,100	372	5,100	195	88	565	268
6	302		850	430	790	2,320	338	3.860	172	72	390	140
7	250		648	410	730	3,180	320	2,100	161	75	2,100	109
8	235		565	850	675	2,800	320	1.300	140	64	4,920	110
9	208		450	980	882	2,220	470	1,100	119	51	1,700	140
10	195		410	730	915	2,100	540	850	107	83	1,040	195
11	172		430	620	980	1,520	430	675	95	172	675	372
12	172		390	565	820	1,180	410	540	119	172	515	430
13	172		355	390	702	1,420	355	620	88	129	430	172
14	140		730	390	675	1,260	355	540	74	100	390	129
15	119		1,120	410	882	1,040	320	430	78	119	372	109
16	119		882	390	1,180	1,180	355	320	81	95	285	95
17	109	390	790	355	2,100	1,000	320	250	83	95	235	250
18	119	515	730	320	1,520	900	285	220	96	81	235	390
19	119	410	592	320	980	850	285	250	88	78	220	355
20	91	620	355	360	760	750	250	250	81	72	184	302
21	105	1,420	285	550	540	675	208	184	74	172	150	1,180
22	83	1,600	235	2,000	675	620	195	161	67	109	129	2,000
23	105	2,560	285	2,800	565	515	390	184	60	81	109	1,040
24	83	2,680	355	1,500	540	492	592	195	64	64	109	492
25	88	2,220	592	882	355	515	410	184	69	72	105	390
26	105	1,900	515	592	450	470	355	220	78	67	105	390
27	150	1,420	410	515	390	430	320	235	172	64	100	372
28	109	1,120	302	470	620	390	302	430	235	83	95	302
29	129	882	302	470	-------	390	430	565	320	1,180	85	220
30	129	675	355	470	-------	302	430	648	302	1,180	81	184
31	98	-------	372	540	-------	320	-------	410	-------	730	74	-------

NOTE.—Discharge Nov. 4-16, Jan. 24, Mar. 17-20 and May 8 and 9 estimated, because of unsatisfactory gage height record, from discharge of West Branch Susquehanna River at Bower. Braced figures show mean discharge for period indicated. Discharge Jan. 18 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for West Branch Susquehanna River at Bower.

Monthly discharge of Clearfield Creek at Dimeling, for the year ending Sept. 30, 1921

(Drainage area 370 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,700	83	252	0.681	0.79
November	2,680	54	694	1.88	2.10
December	1,260	235	611	1.65	1.90
January	2,800	320	660	1.78	2.05
February	2,100	355	750	2.03	2.11
March	3,180	302	1,240	3.35	3.86
April	592	195	369	.997	1.11
May	5,100	161	793	2.14	2.47
June	338	60	146	.395	.44
July	1,180	51	192	.519	.60
August	4,920	74	590	1.59	1.83
September	2,000	72	318	.941	1.05
The year	5,100	51	554	1.50	20.31

DRIFTWOOD BRANCH SINNEMAHONING CREEK AT STERLING RUN

Location.—At three-span steel highway bridge, Sterling Run, Cameron County, about 300 feet upstream from the mouth of Sterling Run.

Drainage Area.—270 square miles.

Records Available.—September 30, 1913, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by C. U. Lupro. Elevation of gage zero 694.60 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are low and subject to overflow during extremely high stages. Bed is composed of gravel. The control for low stages is at the first of a series of gravel riffles extending from 50 to 100 feet below the gage; probably permanent. The control for medium and high stages, which was at the first of a series of riffles extending from 300 to 500 feet below the gage, was changed on September 10 by a gravel bar deposited by flow from Sterling Run.

Extremes of Discharge.—Maximum stage during the year, 3.22 observed at 3 p. m. March 7 (discharge, 2,470 second-feet); a stage of 3.43 feet was observed at 7 a. m. September 22 but the discharge was less than on March 7 due to change of control; minimum, 0.65 foot from 7 a. m. September 1 to 7 p. m. September 3 (discharge, 20 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation changed September 10 and also affected by ice. Rating curve used to September 9 well defined between 20 and 10,000 second-feet; curve used from September 10 fairly well defined. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Driftwood Branch Sinnemahoning Creek at Sterling Run, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
35	Mar. 23	J. M. Snavely	1.78	563
36	June 26*	H. J. McIntyre	.74	37.4

* Measurement made by wading 2,500 feet above gage.

Daily Mean Gage Height, in feet, of Driftwood Branch Sinnemahoning Creek at Sterling Run, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.84	0.83	1.58	1.30	1.48	1.58	1.96	2.09	-------	1.22	0.71	0.65
2	1.38	.88	1.70	1.48	1.68	1.53	1.90	1.99	-------	.98	.76	.65
3	1.32	1.44	1.72	1.50	1.62	1.99	1.88	1.84	-------	.87	1.04	.65
4	1.08	1.29	1.72	1.50	1.57	2.11	1.80	1.83	-------	.81	.94	.68
5	1.03	1.21	1.76	1.54	1.54	2.10	1.72	1.81	1.30	.78	.78	.72
6	.95	1.09	1.70	1.59	1.49	2.15	1.60	1.74	1.18	.74	.72	1.44
7	.90	1.05	1.62	1.50	1.52	3.04	1.54	1.68	1.15	.73	1.25	1.00
8	.88	1.05	1.52	1.90	1.46	3.15	1.48	1.58	1.10	.80	1.89	.83
9	.84	1.07	1.44	1.95	1.49	3.02	1.84	1.52	1.06	.73	1.42	.82
10	.83	1.10	1.40	1.92	1.51	2.82	1.68	1.42	1.00	.71	1.21	2.10
11	.80	1.05	1.45	1.84	1.56	2.48	1.69	1.45	.99	.78	1.02	2.83
12	.84	1.04	1.35	1.72	1.53	2.30	1.65	1.48	1.44	.74	1.01	2.32
13	.87	.99	1.41	1.61	1.43	2.44	1.60	1.44	1.22	.92	1.00	1.60
14	.82	.97	2.46	1.55	1.42	2.34	1.60	1.42	1.00	.84	.98	1.47
15	.76	1.02	2.49	1.50	1.44	2.22	1.66	1.32	.93	.80	.93	1.38
16	.73	1.05	2.26	1.45	1.76	2.28	1.58	1.28	.89	.79	.86	1.26
17	.75	1.30	2.04	1.30	2.69	2.23	1.71	1.22	.86	.90	.81	1.28
18	.74	1.37	1.86	1.24	2.58	2.19	1.71	1.19	.96	.85	1.17	1.94
19	.73	1.25	1.72	1.20	2.34	1.98	1.67	1.15	.88	1.01	1.10	1.64
20	.75	1.38	1.45	1.34	2.06	1.89	1.60	1.15	.82	1.05	.92	1.45
21	.73	1.71	1.36	1.50	1.86	1.80	1.51	1.10	.77	.90	.84	1.82
22	.73	2.10	1.51	1.51	1.83	1.82	1.50	1.07	.76	.79	.79	3.15
23	.72	2.78	1.66	1.66	1.62	1.80	1.83	1.78	.76	.77	.76	2.55
24	.72	2.96	1.66	1.64	1.55	1.76	2.16	1.85	.83	.74	.74	2.13
25	.72	2.60	1.68	1.52	1.55	1.80	2.09	1.72	.77	.70	.73	1.88
26	.72	2.46	1.82	1.56	1.55	1.74	1.95	1.60	.74	.68	.71	1.96
27	.73	2.06	1.83	1.54	1.39	1.70	1.55	1.49	.72	.71	.70	1.70
28	.95	1.87	1.52	1.51	1.62	1.66	1.83	1.72	.72	.70	.69	1.60
29	.90	1.71	1.35	1.54	-------	1.86	1.86	-------	1.34	.76	.67	1.54
30	.92	1.58	1.38	1.52	-------	1.86	2.04	-------	1.32	.89	.67	1.45
31	.87	-------	1.36	1.62	-------	1.90	-------	-------	-------	.80	.66	-------

NOTE.—Stage-discharge relation Dec. 25-27 and Feb. 2-6 affected by ice. Gage height May 29 to June 4 not observed.

Daily discharge, in second-feet, of Driftwood Branch Sinnemahoning Creek at Sterling Run, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	566	46	356	195	280	356	674	810	400	159	26	20
2	235	56	450	289	240	321	620	701	350	80	34	20
3	205	267	466	300	220	701	602	566	300	54	97	20
4	109	190	466	300	200	810	530	557	250	42	70	23
5	94	154	498	328	220	810	466	539	195	37	37	28
6	72	112	450	363	280	865	370	482	143	31	28	267
7	60	100	386	300	314	2,110	328	434	132	30	172	85
8	56	100	314	620	278	2,470	289	356	115	40	611	46
9	48	106	267	665	294	2,110	566	314	103	30	256	44
10	46	115	245	638	307	1,770	434	256	85	26	154	647
11	40	100	272	566	342	1,310	442	272	82	37	91	1,600
12	48	97	220	466	321	1,040	410	289	267	31	88	847
13	54	82	250	378	262	1,240	370	267	159	65	85	262
14	44	78	1,240	335	256	1,100	370	256	85	48	80	198
15	34	91	1,310	300	267	920	418	205	68	40	68	159
16	30	100	980	272	498	1,040	356	186	58	38	52	113
17	32	195	760	195	1,610	980	458	159	52	60	42	120
18	31	230	584	168	1,460	920	458	146	75	50	140	506
19	30	172	466	150	1,100	692	426	132	56	88	115	286
20	32	235	272	215	760	611	370	132	44	100	65	190
21	30	458	225	300	584	530	307	115	36	60	48	408
22	30	810	307	307	557	548	300	106	34	38	38	2,130
23	28	1,770	418	418	386	530	557	514	34	36	34	1,160
24	28	2,020	418	402	335	498	865	575	46	31	31	694
25	28	1,460	380	314	335	530	810	466	36	25	30	476
26	28	1,240	300	342	335	482	665	370	31	23	26	523
27	30	760	300	328	240	450	335	294	28	26	25	332
28	72	593	314	307	386	418	557	466	28	25	24	262
29	60	458	220	328	-------	584	584	650	215	34	22	232
30	65	356	235	314	-------	584	760	600	210	58	22	190
31	54	-------	225	386	-------	620	-------	475	-------	40	21	-------

NOTE.—Discharge Dec. 25-27 and Feb. 2-6 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Allegheny River at Larabee. Discharge May 29 to June 4 estimated, because of no gage height record, from discharge of Allegheny River at Larabee and comparison with gage height graph for Driftwood Branch Sinnemahong Creek at Driftwood.

Monthly discharge of Driftwood Branch Sinnemahoning Creek at Sterling Run, for the year ending Sept. 30, 1921

(Drainage area 270 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	566	28	74.8	0.277	0.32
November	2,020	46	418	1.55	1.73
December	1,310	220	439	1.63	1.88
January	665	150	348	1.29	1.49
February	1,610	200	453	1.68	1.75
March	2,470	321	902	3.34	3.85
April	865	289	490	1.81	2.02
May	810	106	377	1.40	1.61
June	400	28	124	.459	.51
July	159	23	47.8	.177	.20
August	611	21	84.9	.314	.36
September	2,130	20	395	1.46	1.63
The year	2,470	20	345	1.28	17.35

SUSQUEHANNA BASIN—STATION NO. 17

DRIFTWOOD BRANCH SINNEMAHONING CREEK AT DRIFTWOOD

Location.—At two-span steel highway bridge, Driftwood, Cameron County, about 1,000 feet above confluence of Driftwood Branch with Bennett Branch.

Drainage Area.—316 square miles.

Records Available.—July 1, 1895, to February 28, 1903, and July 22, 1918, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to hundredths twice daily by H. B. Mutthersbough; during high stages more frequently. Elevation of gage zero 791.30 feet, United States Geological Survey datum.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and rock. Stage-discharge relation affected by backwater from Bennett Branch Sinnemahoning Creek at medium and high stages.

Extremes of Stage..—Maximum gage height during the year, 4.42 feet observed at 7 a. m. March 8; minimum, 0.10 foot from 4 p. m. July 9 to 4 p. m. July 10 and from 4 p. m. August 31 to 4 p. m. September 2.

Ice.—Stage-discharge relation usually affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

Daily Mean Gage Height, in feet, of Driftwood Branch Sinnemahoning Creek at Driftwood, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.96	0.48	1.78	1.40	1.85	2.27	2.37	2.47	2.70	0.95	0.95	0.10
2	1.83	.83	2.10	1.43	1.80	1.97	2.20	2.44	2.10	.75	1.10	.10
3	1.53	1.28	2.10	1.35	1.75	2.07	2.07	2.32	1.50	.58	1.75	.40
4	1.13	1.43	1.99	1.27	1.69	2.02	1.92	2.42	1.28	.49	1.55	.55
5	1.08	1.23	2.00	1.30	1.61	2.22	1.86	2.60	1.20	.45	1.24	.50
6	.92	1.12	2.25	1.45	1.64	2.37	1.68	2.62	1.06	.50	1.10	1.50
7	.81	.98	2.29	2.00	1.55	3.30	1.57	2.42	.98	.42	1.45	1.36
8	.70	1.03	2.11	2.20	2.05	4.20	1.52	2.18	.88	.32	1.55	1.15
9	.53	1.53	2.00	2.05	2.09	3.91	1.62	1.97	.82	.15	1.95	1.25
10	.43	1.53	1.89	1.95	1.90	3.52	1.72	1.76	.72	.10	1.70	2.15
11	.28	1.30	1.77	1.83	1.74	3.11	1.64	1.61	.79	.80	1.48	2.85
12	.58	1.19	1.67	1.80	1.63	2.97	1.56	1.61	1.45	.65	1.30	2.50
13	.72	1.05	1.50	1.75	1.55	2.92	1.44	1.70	-------	.45	1.05	2.19
14	.68	.95	1.76	1.80	1.60	2.67	1.36	1.78	-------	.30	1.40	1.85
15	.55	.90	2.47	2.00	1.75	2.37	1.67	1.65	-------	.55	1.65	1.66
16	.46	1.00	2.44	1.90	2.02	2.01	1.77	1.46	-------	.70	1.45	1.44
17	.87	1.90	2.29	1.83	3.04	2.27	1.84	1.24	-------	.60	1.55	1.66
18	.80	2.40	2.10	1.74	2.86	2.37	1.82	1.13	-------	.50	1.82	1.80
19	.71	2.29	2.00	1.64	2.57	2.22	1.74	.98	-------	.42	1.75	1.49
20	.60	2.10	1.80	1.63	2.37	2.22	1.67	.89	-------	.58	1.45	1.19
21	.52	1.95	1.67	1.63	2.27	2.27	1.54	.80	-------	.48	1.25	1.33
22	.47	2.05	1.65	1.70	2.11	2.17	1.43	.75	-------	.42	1.04	3.75
23	.42	2.45	1.85	1.95	2.07	2.02	1.86	.82	-------	.39	.88	3.35
24	.38	3.00	1.83	1.95	2.42	1.94	2.60	.88	-------	.30	.80	2.65
25	.34	2.95	1.77	1.93	2.57	1.86	2.47	1.45	-------	.30	.76	2.55
26	.48	2.90	1.74	1.85	2.40	1.82	2.28	1.45	.34	.26	.56	2.34
27	.48	2.60	1.63	1.75	2.34	1.71	2.37	1.30	.35	.20	.42	2.04
28	.40	2.30	1.56	1.71	2.52	1.71	2.37	1.34	.45	.18	.28	1.91
29	.36	2.00	1.51	1.65	-------	1.92	2.42	2.60	.80	.51	.20	1.45
30	.53	1.73	1.45	1.85	-------	1.84	2.42	3.55	1.15	1.25	.16	1.70
31	.57	-------	1.37	1.93	-------	1.92	-------	3.35	-------	1.05	.11	-------

NOTES.—Gage height June 13-25 not observed.

SUSQUEHANNA BASIN—STATION NO. 18

WEST BRANCH SUSQUEHANNA RIVER AT RENOVO

Location.—At three-span steel highway bridge, Eighth Street, Renovo, Clinton County.

Drainage Area.—2,990 square miles.

Records Available.—July 1, 1895, to December 31, 1903, and October 1, 1905, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by F. H. Walize and J. H. Baird. Elevation of gage zero 634.03 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of rocks. Control is at first of a series of riffles about 1,000 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 7.97 feet observed at noon March 8 (discharge, 28,600 second-feet); minimum, —0.10 foot at 5 p. m. July 9 (discharge, 530 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined between 200 and 75,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of West Branch Susquehanna River at Renovo, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
44	Mar. 24	J. M. Snavely	2.85	5,650
45	June 25	H. L. Landis	.12	694

Daily Mean Gage Height, in feet, West Branch Susquehanna River at Renovo, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.57	0.36	3.13	1.90	2.50	2.60	2.95	3.76	4.07	1.21	1.45	0.04
2	3.70	.32	3.37	1.89	2.11	2.51	3.26	3.65	3.26	.82	1.07	−.04
3	3.08	1.05	3.75	1.93	1.82	3.05	3.26	3.53	2.74	.54	1.10	−.03
4	2.41	1.58	3.86	2.28	1.63	5.17	2.93	3.42	2.35	.33	1.85	−.02
5	1.94	1.48	3.70	2.20	1.55	5.05	2.72	4.44	1.95	.22	1.93	−.01
6	1.64	1.25	3.46	2.08	2.01	5.07	2.53	6.62	1.75	.07	1.36	.02
7	1.39	1.04	3.16	2.03	2.02	6.14	2.35	5.80	1.56	.06	1.20	1.09
8	1.14	.87	2.93	2.33	2.37	7.73	2.20	4.78	1.43	.02	5.10	.73
9	.92	.80	2.66	3.32	2.46	7.32	2.40	4.14	1.26	−.08	4.97	.35
10	.75	.90	2.40	3.17	2.47	6.92	2.55	3.58	1.06	.02	3.40	.19
11	.66	.92	2.30	2.94	3.01	6.16	2.57	3.14	.96	.37	2.30	1.83
12	.60	.75	2.20	2.74	2.77	4.36	2.40	2.84	1.20	.85	1.98	2.63
13	.55	.55	2.04	2.52	2.72	5.17	2.33	2.79	1.15	1.19	1.54	1.83
14	.51	.42	2.91	2.27	2.57	5.27	2.25	2.65	.81	.97	1.57	1.40
15	.47	.40	5.11	2.15	2.58	5.07	2.16	2.44	.66	.62	1.50	.98
16	.43	.55	5.05	2.05	3.07	4.76	2.16	2.24	.48	.57	1.21	.72
17	.37	1.20	4.34	1.97	4.82	5.00	2.36	2.02	.46	.53	1.05	.92
18	.33	2.27	3.80	2.02	5.31	4.71	2.33	1.84	.55	.31	1.26	3.04
19	.29	2.20	3.33	2.35	4.62	4.08	2.28	1.74	.57	.19	1.50	2.80
20	.23	2.32	2.92	2.31	3.93	3.74	2.19	1.63	.35	.64	1.25	2.20
21	.19	2.82	2.50	2.19	3.44	3.54	2.05	1.50	.22	.84	.98	2.42
22	.15	3.82	2.23	2.72	3.22	3.26	1.90	1.39	.17	.55	.79	7.02
23	.11	5.55	2.48	4.36	2.92	2.94	2.24	1.68	.24	.28	.60	5.38
24	.07	6.62	2.85	4.37	2.54	2.86	3.39	2.15	.22	.20	.47	4.18
25	.03	6.10	2.92	3.47	2.32	2.86	3.51	2.02	.15	.11	.29	3.32
26	.05	5.45	2.55	2.87	2.16	2.79	3.24	1.87	.09	.14	.21	2.91
27	.35	4.73	2.30	2.50	2.16	2.70	3.18	1.72	.01	.00	.15	2.53
28	.40	4.20	2.30	2.35	2.22	2.62	2.98	1.69	.00	.00	.10	2.19
29	.40	3.72	2.17	2.19	------	2.65	2.98	3.86	.61	.39	.03	1.88
30	.40	3.32	2.00	2.30	------	2.70	3.61	5.37	1.24	1.55	.00	1.61
31	.39	------	1.98	2.49	------	2.64	------	4.77	------	1.88	−.02	------

NOTE—Stage-discharge relation Jan. 14-22 affected by ice.

Daily discharge, in second-feet, of West Branch Susquehanna River at Renovo, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,400	950	5,930	3,130	4,350	4,590	5,650	8,050	9,100	2,000	2,300	578
2	7,700	900	6,800	3,130	3,510	4,350	6,510	7,460	6,510	1,460	1,860	578
3	5,930	1,720	8,050	3,130	2,950	5,650	6,510	7,100	4,840	1,160	1,860	586
4	4,120	2,620	8,400	3,910	2,620	13,400	5,370	6,800	4,120	950	2,950	594
5	3,130	2,460	7,700	3,710	2,620	12,600	4,840	10,200	3,320	800	3,130	602
6	2,620	2,000	7,100	3,500	3,320	13,000	4,350	20,200	2,950	655	2,300	610
7	2,300	1,720	6,220	3,320	3,320	17,600	4,120	16,100	2,620	655	2,000	1,860
8	1,860	1,520	5,370	3,910	4,120	26,800	3,710	11,800	2,300	610	13,000	1,400
9	1;590	1,460	4,840	6,510	4,350	24,400	4,120	9,100	2,150	546	12,600	950
10	1,400	1,590	4,120	6,220	4,350	22,000	4,590	7,400	1,860	610	6,800	800
11	1,280	1,590	3,910	5,370	5,650	18,100	4,590	5,930	1,660	950	3,910	2,950
12	1,220	1,400	3,710	4,840	5,100	10,200	4,120	5,100	2,000	1,520	3,320	4,590
13	1,160	1,160	3,320	4,350	4,840	13,400	3,910	5,100	2,000	2,000	2,460	2,950
14	1,110	1,000	5,370	3,200	4,590	13,800	3,710	4,590	1,460	1,660	2,620	2,300
15	1,060	1,000	13,000	2,800	4,590	13,000	3,710	4,120	1,280	1,220	2,460	1,720
16	1,060	1,160	12,600	3,200	5,930	11,800	3.710	3,710	1,110	1,160	2,000	1,340
17	950	2,000	9,800	3,000	11,800	12,600	4,120	3,320	1,060	1,160	1,720	1,590
18	950	3,910	8,050	2,400	13,800	11.400	3,910	2,950	1,160	900	2,150	5,650
19	900	3,710	6,510	1,900	11,000	9,100	3,910	2,780	1,160	800	2,460	5,100
20	850	3,910	5,370	1,700	8,400	7,700	3,710	2,620	950	1,280	2,000	3,710
21	800	5,100	4,350	1,900	6,800	7.100	3,320	2,460	800	1,520	1,720	4,120
22	750	8,050	3,710	3,000	6,220	6,510	3,130	2,300	750	1,160	1,460	22,600
23	700	15,100	4,350	10,200	5,370	5,370	3,710	2,780	850	900	1,220	14,200
24	655	20,200	5,100	10,200	4,350	5,370	6,800	3,710	800	800	1,060	9.450
25	655	17,600	5,370	7,100	3.910	5,370	7,100	3,320	750	700	900	6,510
26	655	14,200	4,590	5,370	3,710	5,100	6,220	3,130	700	750	800	5,370
27	950	11,400	3,910	4,350	3,710	4,840	6,220	2,780	610	610	750	4,350
28	1,000	9,450	3,910	4,120	3,710	4,590	5,650	2,780	610	610	700	3,710
29	1,000	7,700	3,710	3,710	-------	4,590	5,650	8,400	1,220	1,000	655	3,130
30	1,000	6,510	3,320	3,910	-------	4,840	7,400	14,200	2,000	2,620	610	2,620
31	1,000	-------	3,320	4,350	-------	4,590	-------	11,800	-------	3,130	594	-------

NOTE—Discharge Jan. 14-22 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for West Branch Susquehanna River at Bower and Williamsport.

Monthly discharge of West Branch Susquehanna River at Renovo, for the year ending Sept. 30, 1921

(Drainage area 2,990 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	7,700	655	1,860	0.622	0.72
November	20,200	900	5,100	1.71	1.91
December	13,000	3,320	5,860	1.96	2.26
January	10,200	1,700	4,240	1.42	1.64
February	13,800	2,620	5,320	1.78	1.85
March	26,800	4,350	10,400	3.48	4.01
April	7,400	3,130	4,810	1.61	1.80
May	20,200	2,300	6,520	2.18	2.51
June	9,100	610	2,090	.699	.78
July	3,130	546	1,160	.388	.45
August	13,000	594	2,720	.910	1.05
September	22,600	578	3,880	1.30	1.45
The year	26,800	546	4,500	1.51	20.43

SUSQUEHANNA BASIN—STATION NO. 19

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN

Location.—At site of four-span wooden covered highway bridge, Jay Street, Lock Haven, Clinton County.

Drainage Area.—3,350 square miles.

Records Available.—October 1, 1913, to September 30, 1921.

Gages.—Painted staff on right side of first pier; read to half-tenths twice daily by E. A. McGill; during high stages more frequently. Elevation of gage zero 540.95 feet, United States Geological Survey datum. Previous to January 27, 1919, a standard chain gage was attached to the downstream side of the wooden covered bridge, which was destroyed by fire, for the purpose of obtaining low stages. Gage heights for the year ending September 30, 1921, have been referred to the gage established October 4, 1921; elevation of gage zero 535.00 feet.

Channel and Control. Both banks are high and not subject to overflow. Control for medium and high stages is the remaining portion of an old dam about 2,300 feet below gage; probably permanent.

Extremes of Stage.—Maximum open-water gage height during the year, 9.95 feet observed at 5 p. m. March 8; a stage of 10.6 feet, estimated from hydrograph, was reached at noon January 30, but the water was held back by an ice jam; minimum, not determined.

Ice.—Stage-discharge relation seriously affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

Daily Mean Gage Height, in feet, of West Branch Susquehanna River at Lock Haven, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.
1												
2												
3												
4						5.95						
5						6.07						
6								7.97				
7						6.95		7.12				
8						9.33		5.84				
9					6.33	8.70						
10					7.20	8.20						
11					6.33	6.45						
12												
13						6.33						
14												
15												
16			6.07									
17												
18					6.57							
19												
20												
21												
22												
23		6.95		7.20								
24		7.89		6.07								
25		7.40		5.95								
26		6.57										
27				7.95								
28				8.72								
29				7.67								
30				9.41								
31				6.64								

NOTE—Gage height referred to zero of chain gage established Oct. 4, 1921, elevation 535.00 feet United States Geological Survey datum. Gage height not observed on days of no record. Stage-discharge relation Jan. 19-23 and Jan. 27 to Feb. 16 affected by ice.

SUSQUEHANNA BASIN—STATION NO. 20

BALD EAGLE CREEK AT MILESBURG

Location.—At two-span Pennsylvania Railroad bridge, Milesburg, Centre County, about 1,000 feet above the mouth of Spring Creek.

Drainage Area.—140 square miles.

Records Available.—February 6, 1911, to September 30, 1921.

Gage.—Staff fastened to downstream end of bridge pier; read by P. H. Haupt.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank is high, steep and rocky; left is low and subject to overflow at extremely high stages. Control is at a riffle about 100 feet upstream from the mouth of Spring Creek, where bed is composed of gravel and boulders; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 5.7 feet at 10 a. m. December 14 (discharge, about 5,200 second-feet); minimum, 0.05 foot from 4 p. m. June 24 to 4 p. m. June 26, several times in July and several days in August and September (discharge, 12 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 2,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good. The following discharge measurement was made by H. L. Landis: No. 29, June 24: Gage height, 0.19 foot; discharge, 20.2 second-feet.

Daily Mean Gage Height, in feet, of Bald Eagle Creek at Milesburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.10	0.20	3.14	0.74	1.12	1.88	1.72	1.78	0.98	1.12	0.32	0.05
2	1.28	.73	2.20	.98	1.08	1.98	1.29	1.72	.85	.82	.38	.08
3	.98	1.32	1.79	1.05	1.10	3.10	1.11	1.62	.78	.60	.78	.15
4	.80	.80	1.64	1.03	1.18	2.75	.98	2.20	.82	.44	.65	.10
5	.72	.54	1.51	1.00	1.28	2.35	.88	4.68	.72	1.68	.45	.10
6	.64	.44	1.38	.96	1.48	2.57	.82	3.07	.62	1.38	.28	.05
7	.55	.52	1.26	.92	1.26	3.53	.75	2.38	.55	.52	1.61	.05
8	.48	.44	1.12	1.04	1.22	3.32	.78	2.02	.45	.68	2.15	.05
9	.42	.42	1.02	.98	1.70	3.13	2.32	1.64	.38	.58	1.38	.05
10	.38	.52	.92	.94	1.65	2.70	1.70	1.40	.32	.48	1.10	.05
11	.35	.48	.98	.88	1.55	2.20	1.21	1.21	.32	.42	.92	.72
12	.38	.38	.90	.85	1.41	1.89	1.02	1.30	.38	.36	.78	.68
13	.34	.34	.97	.85	1.38	2.20	.95	1.95	.32	.32	.70	.58
14	.28	.28	4.42	.95	1.85	1.76	.88	2.00	.28	.28	.62	.48
15	.24	.25	3.16	1.14	2.00	1.78	.98	1.64	.24	.28	.52	.42
16	.20	1.22	2.18	1.09	2.02	2.22	1.03	1.35	.18	.22	.42	.35
17	.42	3.20	1.78	.94	2.44	2.02	1.55	1.20	.15	.16	.32	1.56
18	.36	2.18	1.51	.82	2.00	1.84	1.26	1.06	.58	.12	.62	1.57
19	.32	1.84	1.25	.72	1.78	1.65	1.15	.95	.38	.22	.52	.98
20	.25	1.72	1.06	.78	1.65	1.52	1.04	.90	.28	.58	.42	.61
21	.20	1.78	.94	1.41	1.45	1.35	.92	.88	.18	.42	.32	2.79
22	.16	2.47	.92	3.30	1.32	1.20	.85	.85	.14	.32	.24	2.81
23	.12	3.31	1.51	3.08	1.22	1.04	3.46	1.08	.10	.22	.20	1.42
24	.10	2.70	1.30	2.28	1.05	.89	3.20	.86	.06	.14	.18	1.05
25	.10	2.38	1.18	1.80	.92	1.18	2.07	.72	.05	.08	.14	.92
26	.19	2.10	1.08	1.42	.82	1.08	1.76	.65	.05	.28	.10	.76
27	.35	1.90	1.02	1.15	1.22	.98	1.55	.58	.12	.35	.10	.65
28	.44	1.69	.92	.99	1.78	.98	1.35	1.30	.26	.15	.07	.58
29	.38	1.48	.88	.85	------	.98	1.60	1.40	.48	.55	.05	.52
30	.28	1.69	.82	1.12	------	.88	1.72	1.19	1.36	.68	.05	.46
31	.24	------	.78	1.31	------	.92	------	1.08	------	.45	.05	------

Daily discharge, in second-feet, of Bald Eagle Creek at Milesburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	420	21	1,160	72	121	330	255	290	103	121	30	12
2	155	71	470	103	121	375	155	255	85	82	34	14
3	103	155	290	114	121	1,110	121	226	77	55	77	18
4	79	79	240	114	137	805	103	470	82	40	61	15
5	69	49	198	106	155	552	89	3,390	69	255	40	15
6	60	40	175	100	198	670	82	1,030	57	175	27	12
7	50	47	146	95	146	1,650	73	580	50	47	226	12
8	43	40	121	114	137	1,340	77	375	40	65	445	12
9	38	38	106	103	255	1,160	525	240	34	53	175	12
10	34	47	95	98	240	770	255	175	30	43	121	12
11	32	43	103	89	212	470	137	137	30	38	95	69
12	34	34	92	85	175	330	106	155	34	33	77	65
13	31	31	102	85	175	470	99	352	30	30	67	53
14	27	27	2,900	99	310	272	89	375	27	27	57	43
15	24	24	1,160	129	375	290	103	240	24	27	47	38
16	21	137	470	121	375	470	114	165	20	22	38	32
17	38	1,220	290	98	610	375	212	137	18	19	30	212
18	33	470	198	82	375	310	146	114	53	16	57	212
19	30	310	146	69	290	240	129	99	34	22	47	103
20	24	255	114	77	240	198	114	92	27	53	38	56
21	21	290	98	175	186	165	95	89	20	38	30	840
22	19	610	95	1,340	155	137	85	85	17	30	24	840
23	16	1,340	198	1,110	137	114	1,520	121	15	22	21	175
24	15	770	155	525	114	91	1,220	87	13	17	20	114
25	15	580	137	290	95	137	398	69	12	14	17	95
26	20	420	121	175	82	121	272	61	12	27	15	74
27	32	330	106	129	137	103	212	53	16	32	15	61
28	40	255	95	105	290	103	165	155	25	18	14	53
29	34	198	89	85	------	103	226	175	43	50	12	47
30	27	255	82	121	------	89	255	137	165	65	12	41
31	24	------	77	155	------	95	------	121	------	40	12	------

Monthly discharge of Bald Eagle Creek at Milesburg, for the year ending Sept. 30, 1921
(Drainage area 140 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	420	15	51.9	0.371	0.43
November	1,340	21	273	1.95	2.18
December	2,900	77	317	2.26	2.61
January	1,340	69	199	1.42	1.64
February	610	82	213	1.52	1.58
March	1,650	89	434	3.10	3.57
April	1.520	73	248	1.77	1.98
May	3,390	53	325	2.32	2.68
June	165	12	42.1	.301	.34
July	255	14	50.8	.363	.42
August	445	12	63.9	.456	.53
September	840	12	112	.800	.89
The year	3,390	12	194	1.39	18.85

SUSQUEHANNA BASIN—STATION NO. 21

BALD EAGLE CREEK AT BEECH CREEK STATION

Location.—At three-span steel highway bridge, Beech Creek Station, Pennsylvania Railroad, Clinton County.

Drainage Area.—565 square miles.

Records Available.—June 24, 1910, to Septmber 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by G. A. Rodgers.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Right bank is high and not subject to overflow; left bank subject to overflow at extremely high stages. Bed is composed of gravel and rocks. Control is at a riffle, about 1,000 feet below gage, where there is a pronounced fall; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 7.3 feet at noon May 5 (discharge, 8.120 second-feet); minimum, 1.75 feet at 4 p. m. September 15 and 16 (discharge, 208 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation probably permanent throughout of the year except when affected by ice. Rating curve fairly well defined. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Bald Eagle Creek at Beech Creek Station, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
33	Mar. 29	J. M. Snavely	2.52	674
34	June 24	H. J. McIntyre	1.94	294
35	25	H. L. Landis	1.90	275

Daily Mean Gage Height, in feet, of Bald Eagle Creek at Beech Creek Station, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.40	1.90	3.35	2.35	2.58	3.16	3.13	3.22	2.92	2.16	1.78	1.79
2	2.65	2.15	3.38	2.42	2.48	3.14	2.94	3.32	2.74	2.14	1.88	1.79
3	2.50	2.75	3.28	2.40	2.42	4.00	2.86	3.18	2.61	1.99	2.12	1.78
4	2.42	2.35	3.22	2.38	2.41	4.21	2.82	3.53	2.64	1.91	2.06	1.82
5	2.32	2.25	3.18	2.32	2.42	3.85	2.74	6.42	2.44	1.94	1.99	1.87
6	2.28	2.20	3.05	2.42	2.60	3.79	2.68	5.33	2.37	2.43	1.94	1.92
7	2.22	2.18	2.90	2.30	2.68	4.98	2.63	4.42	2.31	2.08	2.33	1.86
8	2.19	2.14	2.78	2.50	2.70	5.74	2.59	3.88	2.28	2.00	3.22	1.83
9	2.16	2.18	2.72	2.48	2.90	5.19	2.91	3.54	2.24	1.92	2.48	1.79
10	2.14	2.18	2.66	2.35	2.99	4.96	2.69	3.24	2.18	2.40	2.27	1.76
11	2.10	2.12	2.64	2.38	2.89	4.40	2.58	3.05	2.16	2.06	2.18	2.06
12	2.12	2.10	2.58	2.40	2.76	3.95	2.54	2.96	2.16	1.95	2.44	1.94
13	2.10	2.09	2.48	2.25	2.72	3.98	2.52	3.45	2.08	2.02	2.16	1.81
14	2.08	2.10	4.22	2.32	2.81	4.32	2.49	3.25	2.02	1.90	2.45	1.78
15	2.00	2.10	4.35	2.38	3.02	3.60	2.50	3.10	2.00	1.90	2.43	1.76
16	2.05	2.34	3.68	2.30	3.30	3.60	2.49	2.99	2.00	1.96	2.18	1.76
17	2.05	3.91	3.38	2.38	3.92	3.49	2.86	2.88	2.02	1.86	2.08	1.99
18	2.05	3.45	3.15	2.45	3.70	3.44	2.76	2.80	2.22	1.82	2.44	2.54
19	2.05	3.25	2.98	2.32	3.38	3.28	2.68	2.72	2.03	1.83	2.20	2.17
20	2.05	3.12	2.88	2.44	3.26	3.20	2.58	2.60	1.94	2.43	2.08	1.95
21	2.00	3.75	2.78	2.63	3.10	3.10	2.54	2.48	1.90	2.12	2.04	2.78
22	2.00	3.28	2.68	3.82	2.95	2.95	2.49	2.39	1.90	2.02	1.98	3.75
23	2.00	4.37	2.88	4.23	2.78	2.79	4.09	2.65	1.98	1.96	1.97	2.94
24	1.95	4.48	2.68	3.58	2.72	2.76	4.47	2.52	1.92	1.91	1.95	2.58
25	1.90	4.18	2.58	3.15	2.60	2.75	3.68	2.50	1.88	1.88	1.92	2.53
26	2.05	3.88	2.50	3.12	2.48	2.62	3.39	2.46	1.84	1.81	1.88	2.42
27	2.10	3.55	2.52	2.84	2.61	2.60	3.22	2.40	1.94	1.78	1.85	2.24
28	2.12	3.30	2.55	2.66	3.00	2.58	3.02	2.57	1.90	1.86	1.82	2.18
29	2.02	3.10	2.42	2.60	-------	2.54	3.10	3.60	2.28	1.97	1.80	2.09
30	1.95	2.98	2.48	2.64	-------	2.49	3.22	3.40	2.50	2.08	1.81	2.05
31	1.95	-------	2.42	2.90	-------	2.51	-------	3.10	-------	1.88	1.78	-------

NOTE—Stage-discharge relation Jan. 17-20 affected by ice.

Daily discharge, in second-feet, of Bald Eagle Creek at Beech Creek Station, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,420	280	1,420	560	740	1,240	1,140	1,240	975	428	221	226
2	778	428	1,420	595	665	1,140	1,020	1,320	855	428	270	226
3	665	855	1,320	595	595	2,140	935	1,240	740	330	395	221
4	595	560	1,240	595	595	2,400	895	1,530	778	286	365	240
5	525	492	1,240	525	595	1,900	855	6,160	630	302	330	265
6	525	460	1,060	595	740	1,900	815	4,140	560	630	302	291
7	460	460	975	525	815	3,620	778	2,680	525	395	560	260
8	460	428	895	665	815	4,860	740	2,020	525	335	1,240	245
9	428	460	815	665	975	3,970	975	1,530	492	291	665	226
10	428	460	778	560	1,060	3,620	815	1,240	460	595	492	212
11	395	395	778	595	975	2,680	740	1,060	428	365	460	365
12	395	395	740	595	855	2,140	702	1,020	428	308	630	302
13	395	395	665	492	815	2,140	665	1,420	395	335	428	235
14	395	395	2,400	525	895	2,540	665	1,240	335	280	630	221
15	335	395	2,680	595	1,060	1,650	665	1,140	335	280	630	212
16	365	560	1,770	525	1,320	1,650	665	1,060	335	313	460	212
17	365	2,020	1,420	460	2,020	1,530	935	975	335	260	395	330
18	365	1,420	1,240	400	1,770	1,420	855	895	460	240	630	702
19	365	1,240	1.060	400	1,420	1,320	815	815	365	245	460	428
20	365	1,140	975	500	1,320	1,240	740	740	302	630	395	308
21	335	1,240	895	778	1,140	1,140	702	665	280	395	365	895
22	335	1,320	815	1,900	1,020	1,020	665	595	280	335	324	1,900
23	335	2,680	975	2,400	895	895	2,270	778	324	313	318	1,020
24	308	2,820	815	1,650	815	855	2,820	665	291	286	308	740
25	280	2,400	740	1,240	740	855	1,770	665	270	270	291	740
26	365	2,020	665	1,140	665	740	1,420	630	250	235	270	595
27	395	1,650	665	935	740	740	1,240	595	302	221	255	492
28	395	1,320	702	778	1,060	740	1,060	702	280	260	240	460
29	335	1,140	595	740	-------	702	1,140	1,650	525	318	230	395
30	308	1,060	665	778	-------	665	1,240	1,420	665	395	235	365
31	308	-------	595	975	-------	665	-------	1,140	-------	270	221	-------

NOTE—Discharge Jan. 17-20 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Bald Eagle Creek at Milesburg.

Monthly discharge of Bald Eagle Creek at Beech Creek Station, for the year ending Sept. 30, 1921

(Drainage area 565 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,420	280	443	0.784	0.90
November	2,820	280	1,030	1.82	2.03
December	2,680	595	1,060	1.88	2.17
January	2,400	400	783	1.39	1.60
February	2,020	595	969	1.72	1.79
March	4,860	665	1,750	3.10	3.57
April	2,820	665	1,020	1.81	2.02
May	6,160	595	1,390	2.46	2.84
June	975	250	458	.811	.90
July	630	221	341	.604	.70
August	1,240	221	420	.743	.86
September	1,900	212	444	.786	.88
The year	6,160	212	842	1.49	20.26

SUSQUEHANNA BASIN—STATION NO. 22

PINE CREEK AT CEDAR RUN

Location.—At single-span steel highway bridge, Cedar Run, Lycoming County.

Drainage Area.—590 square miles.

Records Available.—July 19, 1918, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by C. R. Nivison. Elevation of gage zero 781.96 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank is high; left is low but not subject to overflow. Bed is composed of gravel. Control is at a riffle, where the bed is composed of gravel, about 500 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 5.0 feet at 9 p. m. February 16 (discharge, about 5,070 second-feet); minimum, 1.18 feet on September 1, 2 and 3 (discharge, 48 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 50 and 2,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage heights to rating table. Results good except for high stages when they are fair.

Discharge Measurements of Pine Creek at Cedar Run, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
13	Mar. 29	J. M. Snavely	3.12	1,550
14	June 23*	H. J. McIntyre	1.37	101

*Measurement made by wading 1,500 feet above gage.

Daily Mean Gage Height, in feet, of Pine Creek at Cedar Run, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.66	1.38	2.60	2.00	2.60	2.61	3.19	2.95	2.00	1.86	1.32	1.18
2	2.10	1.38	2.78	2.13	2.58	2.47	3.16	2.92	1.90	1.51	1.37	1.18
3	1.90	1.84	2.89	2.22	2.50	3.22	3.09	2.81	1.82	1.42	1.43	1.18
4	1.72	1.69	2.86	2.11	2.49	3.18	2.97	2.80	1.89	1.40	1.45	1.20
5	1.70	1.60	2.78	2.10	2.49	2.88	2.85	3.22	1.82	1.38	1.40	1.20
6	1.62	1.58	2.71	2.09	2.60	3.13	2.70	3.52	1.71	1.61	1.34	1.32
7	1.56	1.50	2.62	2.08	2.58	4.11	2.60	3.34	1.70	1.51	1.40	1.50
8	1.52	1.50	2.52	2.10	2.48	4.40	2.49	3.14	1.67	1.46	1.98	1.35
9	1.50	1.54	2.38	2.11	2.40	4.53	2.56	2.90	1.62	1.50	1.67	1.27
10	1.48	1.56	2.28	2.12	2.40	4.63	2.44	2.72	1.60	1.66	1.53	1.45
11	1.47	1.52	2.22	2.22	2.44	4.05	2.37	2.57	1.58	1.62	1.65	1.62
12	1.48	1.49	2.18	2.32	2.49	3.62	2.26	2.48	1.58	1.66	1.74	1.70
13	1.48	1.44	2.17	2.40	2.46	4.03	2.22	2.48	1.68	1.74	1.74	1.51
14	1.45	1.45	3.22	2.53	2.38	3.66	2.20	2.38	1.59	1.77	1.46	1.40
15	1.40	1.42	3.62	2.60	2.34	3.56	2.24	2.25	1.51	1.72	1.42	1.36
16	1.40	1.46	3.34	2.54	2.63	3.65	2.02	2.18	1.50	1.71	1.39	1.36
17	1.38	1.61	3.15	2.58	4.22	3.48	2.34	2.10	1.48	1.56	1.37	1.45
18	1.38	1.76	2.84	2.52	3.32	3.31	2.36	2.09	1.50	1.51	1.43	2.75
19	1.36	1.78	2.60	2.42	2.92	3.08	2.30	2.04	1.48	1.50	1.42	2.21
20	1.35	1.78	2.48	2.52	2.73	3.08	2.30	1.95	1.45	1.58	1.39	1.80
21	1.34	1.97	2.38	2.70	2.50	3.00	2.27	1.89	1.40	1.60	1.35	1.92
22	1.34	2.52	2.40	2.90	2.46	2.98	2.28	1.84	1.38	1.50	1.31	3.15
23	1.34	2.88	2.61	3.00	2.38	2.88	3.28	2.15	1.37	1.45	1.30	2.62
24	1.34	3.03	2.56	2.86	2.24	2.80	4.04	2.04	1.36	1.40	1.28	2.28
25	1.32	2.58	2.35	2.52	2.10	2.92	3.66	1.89	1.33	1.35	1.26	2.14
26	1.35	2.22	2.30	2.35	2.09	2.78	3.32	1.91	1.30	1.34	1.24	2.18
27	1.40	2.53	2.40	2.54	2.06	2.80	3.14	1.90	1.30	1.32	1.22	1.97
28	1.44	2.43	2.37	2.51	2.36	2.94	2.89	1.88	1.33	1.33	1.20	1.58
29	1.47	2.31	2.32	2.60	------	2.98	2.80	2.13	1.63	1.37	1.20	1.72
30	1.45	2.22	2.40	2.64	------	2.92	3.00	2.16	1.64	1.42	1.19	1.78
31	1.42	------	2.09	2.60	------	2.86	------	2.04	------	1.40	1.19	------

NOTE—Stage-discharge relation Dec. 26-30 and Jan. 10 to Feb. 16 affected by ice.

Daily discharge, in second-feet, of Pine Creek at Cedar Run, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	995	105	940	380	550	940	1,670	1,350	380	282	87	48
2	460	105	1,170	500	460	780	1,670	1,290	304	145	102	48
3	304	270	1,290	540	380	1,670	1,540	1,170	259	117	120	48
4	215	204	1,230	460	340	1,670	1,350	1,170	298	111	126	53
5	207	174	1,170	460	380	1,290	1,230	1,670	259	105	111	53
6	181	168	1,050	460	460	1,540	1,050	2,070	211	177	93	87
7	161	142	940	460	460	3,120	940	1,800	207	145	111	142
8	148	142	830	460	380	3,720	830	1,540	197	130	365	96
9	142	155	730	460	380	3,920	885	1,290	181	142	197	73
10	136	161	630	420	340	4,130	780	1,050	174	194	152	126
11	133	148	540	380	380	2,920	680	885	168	181	190	181
12	136	139	540	340	420	2,220	585	830	168	194	223	207
13	136	123	500	300	380	2,920	540	830	200	223	223	145
14	126	126	1,670	300	340	2,380	540	730	171	236	130	111
15	111	117	2,220	460	340	2,220	585	585	145	215	117	99
16	111	130	1,800	460	380	2,220	540	540	142	211	108	99
17	105	177	1,670	380	3,320	2,070	680	460	136	161	102	126
18	105	232	1,230	340	1,800	1,800	680	460	142	145	120	1,110
19	99	240	995	300	1,290	1,540	630	420	136	142	117	540
20	96	240	830	300	1,110	1,540	630	342	126	168	108	298
21	93	357	730	500	830	1,410	585	298	111	174	96	319
22	93	830	730	750	780	1,410	630	270	105	142	84	1,670
23	93	1,290	940	950	730	1,290	1,800	500	102	126	81	940
24	93	1,410	885	850	585	1,170	2,920	420	99	111	75	630
25	87	940	680	550	460	1,290	2,380	298	90	96	70	500
26	96	540	500	420	460	1,170	1,800	312	81	93	64	540
27	111	885	550	380	420	1,170	1,540	304	81	87	59	357
28	123	780	500	380	680	1,350	1,290	293	90	90	53	168
29	133	630	420	380	-------	1,410	1,170	500	184	102	53	215
30	126	540	460	500	-------	1,290	1,410	500	187	117	50	240
31	117	-------	460	600	-------	1,230	-------	420	-------	111	50	-------

NOTE—Discharge Dec. 26-30 and Jan. 10 to Feb. 16 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Driftwood Branch Sinnemahoning Creek at Sterling Run and Lycoming Creek near Trout Run.

Monthly discharge of Pine Creek at Cedar Run, for the year ending Sept. 30, 1921

(Drainage area 590 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	995	87	170	0.288	0.33
November	1,410	105	383	.649	.72
December	2,220	420	930	1.58	1.82
January	950	300	465	.788	.91
February	3,320	340	673	1.14	1.19
March	4,130	780	1,900	3.22	3.71
April	2,920	540	1,120	1.90	2.12
May	2,070	270	793	1.34	1.54
June	380	81	171	.290	.32
July	282	87	151	.256	.30
August	365	50	117	.198	.23
September	1,670	48	309	.524	.58
The year	4,130	48	599	1.02	13.77

WEST BRANCH SUSQUEHANNA RIVER AT JERSEY SHORE

Location.—At two-span steel highway bridge, Jersey Shore Lycoming County.

Drainage Area.—5,240 square miles.

Records Available.—October 18, 1913, to September 30, 1921.

Gages.—Staff painted on right abutment and standard chain attached to upstream side of bridge; read by C. B. McCullough to tenths once a day until January 2, tenths twice daily January 3 to February 22 and hundredths twice daily February 23 to September 30; during high stages more frequently. Zero elevations of both gages 517.33 feet, United States Geological Survey datum.

Channel and Control.—Right bank is low and subject to overflow; left is high and not subject to overflow. Bed is composed of gravel and rock.

Extremes of Stage.—Maximum gage height during the year, 11.79 feet observed at 5 p. m. March 9; minimum 1.59 feet at 5 p. m. September 4.

Ice.—Stage-discharge relation seriously affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

Daily Mean Gage Height, in feet, of West Branch Susquehanna River at Jersey Shore, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	------	4.9	8.8	6.15	4.10	4.48	5.50	5.52	2.56	2.70	1.62
2	4.8	------	5.2	8.6	5.75	4.27	4.72	5.64	4.50	2.50	2.48	1.60
3	------	------	5.3	7.4	5.35	4.80	4.72	5.39	4.10	2.25	2.41	1.60
4	------	2.6	5.6	4.3	5.02	6.60	4.66	5.35	3.76	2.01	2.56	1.60
5	------	3.1	------	3.65	4.95	7.10	4.40	7.06	3.46	1.92	2.92	1.65
6	------	------	5.0	3.28	5.38	6.50	4.19	9.22	3.17	2.12	2.71	1.72
7	------	------	4.9	3.25	5.55	8.10	3.96	8.65	2.96	2.00	2.5	1.80
8	------	2.4	4.4	3.25	5.7	10.70	3.74	7.16	2.78	1.88	3.66	2.15
9	------	2.3	4.2	3.6	5.1	11.70	3.81	6.30	2.66	1.88	6.38	1.99
10	------	2.3	4.0	4.4	4.38	11.20	3.96	5.54	2.52	2.20	4.51	1.85
11	------	2.2	4.4	3.95	4.45	9.40	3.84	4.90	2.42	2.22	3.56	2.22
12	------	2.2	------	3.85	4.15	7.78	3.74	4.41	2.48	2.38	3.22	3.65
13	------	2.2	5.7	3.78	3.9	7.56	3.62	4.46	2.64	2.44	2.90	3.22
14	------	------	6.0	4.4	3.7	7.36	3.54	4.43	2.44	2.54	2.80	2.78
15	------	1.9	7.4	7.65	3.82	6.90	3.48	4.16	2.25	2.42	2.85	2.35
16	------	1.8	8.1	7.9	4.1	6.54	3.49	3.87	2.15	2.24	2.67	2.16
17	------	2.9	6.4	7.3	6.0	6.68	3.64	3.66	2.08	2.13	2.54	2.08
18	------	3.8	5.5	6.1	7.25	6.45	3.74	3.50	2.10	2.06	2.55	------
19	------	3.8	4.9	5.6	6.4	5.85	3.66	3.36	2.10	2.02	2.64	4.30
20	------	3.7	4.3	5.2	5.6	5.35	3.59	3.20	2.04	2.19	2.64	3.35
21	------	------	4.2	5.8	5.1	5.16	3.47	3.05	1.94	2.34	2.40	3.62
22	------	4.8	3.7	7.4	4.62	4.91	3.53	2.92	1.90	2.28	2.28	6.73
23	------	5.9	4.5	8.7	4.38	4.59	4.20	2.96	1.88	2.02	2.15	7.57
24	------	------	4.2	10.1	4.12	4.40	6.70	3.44	1.87	1.93	2.04	5.62
25	------	------	4.0	9.3	3.72	4.34	6.34	3.38	1.84	1.86	1.98	4.48
26	------	7.4	3.8	7.55	3.55	4.38	5.64	3.24	1.80	1.76	1.90	3.95
27	------	6.8	4.3	6.5	3.34	4.22	5.24	3.11	1.78	1.70	1.82	3.65
28	------	------	5.0	6.3	3.52	4.10	4.98	3.27	1.74	1.62	1.76	3.25
29	------	5.4	7.4	6.25	------	4.26	4.69	4.73	1.91	1.71	1.75	3.02
30	------	4.4	8.8	6.15	------	4.12	5.45	6.22	2.29	2.07	1.70	2.80
31	------	------	8.9	6.65	------	4.10	------	6.33	------	2.82	1.66	------

NOTE—Gage height not observed on days of no record. Stage-discharge relation Dec. 27 to Jan. 5 and Jan. 15 to Feb. 11 affected by ice.

SUSQUEHANNA BASIN—STATION NO. 24

LYCOMING CREEK NEAR TROUT RUN

Location.—At single-span steel highway bridge, about two and one half miles above Trout Run, Lycoming County.

Drainage Area.—185 square miles.

Records Available.—December 4, 1913, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Miss Orpha Apker. Elevation of gage zero 693.4 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—The right bank overflows during extremely high stages; the left is high and does not overflow. The bed is composed of gravel and large stones. Control is at a riffle about 100 feet below gage, where the bed is composed of gravel; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 8.80 feet observed at 1.30 p. m. December 14 (discharge, about 4,000 second-feet); minimum, 1.68 feet at 4.40 p. m. October 24 (discharge, 20 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined from 30 to 3,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Lycoming Creek near Trout Run, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
49	Mar. 28	J. M. Snavely	3.77	533
50	June 22*	H. L. Landis	1.93	34.5

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* Measurement made by wading 150 feet below gage.

Daily Mean Gage Height, in feet, of Lycoming Creek near Trout Run, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.72	2.08	3.50	2.52	2.42	3.02	4.15	4.22	2.36	1.98	1.80	1.80
2	2.35	2.05	3.42	2.82	2.36	2.72	3.80	3.95	2.28	1.94	1.90	1.77
3	2.16	3.19	3.22	2.78	2.35	4.26	3.74	3.75	2.52	1.88	2.00	1.75
4	2.10	2.68	3.12	2.68	2.30	4.05	3.60	3.62	3.10	1.85	1.94	1.75
5	2.06	2.42	3.08	2.60	2.28	3.63	3.45	4.02	2.40	1.86	1.88	1.98
6	1.98	2.28	3.02	2.59	2.92	3.46	3.30	3.95	2.20	2.02	1.85	1.98
7	1.91	2.30	2.99	2.60	2.65	5.33	3.12	3.70	2.18	1.88	1.86	1.90
8	1.82	2.19	2.96	2.58	2.48	5.97	3.02	3.48	2.15	1.82	1.98	1.90
9	1.80	2.28	2.95	2.48	2.42	6.31	3.26	3.35	2.11	1.80	1.92	1.90
10	1.79	2.18	2.92	2.40	2.40	5.72	3.10	3.15	2.06	1.85	1.82	1.88
11	1.75	2.15	2.85	2.32	2.40	5.07	2.94	2.98	2.05	2.45	1.88	1.94
12	1.85	2.12	2.84	2.35	2.39	4.92	2.88	2.98	2.22	2.58	1.98	1.92
13	1.99	2.11	2.85	2.28	2.33	5.39	2.78	2.96	2.12	2.15	2.10	1.86
14	1.95	2.06	5.97	2.45	2.35	4.99	2.71	2.88	2.07	1.98	2.08	1.82
15	1.90	2.05	5.62	2.58	2.37	4.85	3.05	2.82	2.04	1.95	1.98	1.80
16	1.85	2.16	4.48	2.48	2.71	4.65	2.98	2.76	2.00	2.22	1.92	1.76
17	1.85	3.46	3.92	-------	4.61	4.17	3.48	2.68	2.10	2.05	1.86	1.84
18	1.80	3.25	3.68	-------	3.36	3.89	3.48	2.61	2.12	1.94	1.92	1.85
19	1.80	2.99	3.55	2.38	2.92	3.77	3.32	2.56	2.02	2.20	1.86	1.84
20	1.80	2.97	3.32	2.40	2.92	3.61	3.12	2.48	1.97	2.08	1.85	1.80
21	1.75	3.00	3.12	2.38	2.85	3.61	3.02	2.41	1.95	1.98	1.81	2.18
22	1.74	3.15	-------	2.85	2.72	2.39	2.92	2.36	1.89	1.98	1.80	3.07
23	1.70	3.60	-------	3.20	2.69	3.27	4.68	2.68	1.86	1.96	1.80	2.89
24	1.69	3.58	3.10	2.78	2.65	3.49	5.18	2.58	1.85	1.91	1.80	2.82
25	1.75	3.32	2.88	2.52	2.65	4.62	4.35	2.70	1.81	1.89	1.80	2.80
26	1.78	2.98	2.72	2.79	2.66	3.82	3.95	2.56	1.84	1.86	1.78	2.38
27	2.20	2.82	2.78	2.72	2.55	3.52	3.70	2.48	1.98	1.82	1.76	2.12
28	2.35	2.82	2.72	2.62	2.69	3.60	3.49	2.39	1.91	1.80	1.75	2.05
29	2.20	2.72	2.66	2.42	-------	3.69	3.52	2.58	2.04	1.88	1.75	1.98
30	2.21	2.78	2.58	2.42	-------	3.45	4.22	2.50	1.95	1.85	1.75	2.10
31	2.14	-------	2.62	2.49	-------	3.86	-------	2.42	-------	1.81	1.78	-------

NOTE—Gage height Dec. 22, 23, Jan. 17 and 18 not observed.

Daily discharge, in second-feet, of Lycoming Creek near Trout Run, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	165	52	400	120	105	245	665	665	94	41	27	27
2	92	48	365	190	94	165	505	585	81	38	34	25
3	62	275	305	190	92	705	470	505	120	33	43	24
4	54	165	275	165	84	585	435	435	275	30	38	24
5	50	105	275	142	81	435	382	585	101	31	33	41
6	41	81	245	142	217	382	335	585	68	45	30	41
7	35	84	245	14.	154	1,180	275	470	65	33	31	34
8	28	67	231	142	116	1,600	245	400	61	28	41	34
9	27	81	231	116	105	1,810	320	350	55	27	36	34
10	26	65	217	101	101	1,420	275	290	50	30	28	33
11	24	61	204	87	101	1,080	231	245	48	110	33	38
12	30	57	204	92	99	980	217	245	71	142	41	36
13	42	55	204	81	89	1,240	190	231	57	61	54	31
14	38	50	1,600	110	92	1,030	165	217	51	41	52	28
15	34	48	1,360	142	96	930	260	190	47	38	41	27
16	30	62	790	116	165	835	245	178	43	71	36	25
17	30	382	545	109	835	665	400	165	54	48	31	30
18	27	320	470	103	350	545	400	142	57	38	36	30
19	27	245	435	98	217	505	335	131	45	68	31	30
20	27	231	335	101	217	435	275	116	40	52	30	27
21	24	245	275	98	204	435	245	103	38	41	28	65
22	23	290	275	204	165	365	217	94	33	41	27	260
23	21	435	275	305	165	320	880	165	31	39	27	217
24	20	435	275	190	154	400	1,130	142	30	35	27	190
25	24	335	217	120	154	835	745	165	28	33	27	190
26	26	245	165	190	154	505	585	131	30	31	26	98
27	68	190	190	165	131	400	470	116	41	28	25	57
28	92	190	165	142	165	435	400	99	35	27	24	48
29	68	165	154	105	-------	470	400	142	47	33	24	41
30	70	190	142	105	-------	382	665	120	38	30	24	54
31	60	-------	142	118	-------	545	-------	105	-------	28	26	-------

NOTE—Discharge Dec. 22, 23, Jan. 17 and 18 interpolated, because of no gage height record.

Monthly discharge of Lycoming Creek near Trout Run, for the year ending Sept. 30, 1921

(Drainage area 185 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	165	20	44.7	0.242	0.28
November	435	48	175	.946	1.06
December	1,600	142	362	1.96	2.26
January	305	81	136	.735	.85
February	835	81	168	.908	.95
March	1,810	165	705	3.81	4.39
April	1,130	165	412	2.23	2.49
May	665	94	262	1.42	1.64
June	275	28	61.1	.330	.37
July	142	27	44.2	.239	.28
August	54	24	32.6	.176	.20
September	260	24	61.3	.331	.37
The year	1,810	20	206	1.11	15.14

SUSQUEHANNA BASIN—STATION NO. 25

WEST BRANCH SUSQUEHANNA RIVER AT WILLIAMSPORT

Location.—At five-span steel highway bridge, Market Street, Williamsport, Lycoming County.

Drainage Area.—5,670 square miles.

Records Available.—March 1, 1895, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by J. V. April. Elevation of gage zero 494.55 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Both banks are high and rocky. Bed is composed of silt and gravel; shifts slightly. Control probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 11.8 feet at 1 a. m. March 9 (discharge, 50,900 second-feet); minimum, 0.50 foot at 5 p. m. September 1, 2, 3 and 4 (discharge, 1,230 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined below 2,000 and well defined between 2,000 and 120,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for low stages when they are fair.

Discharge Measurements of West Branch Susquehanna River at Williamsport, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
45	Mar. 26	J. M. Snavely	4.43	11,500
46	June 22	H. J. McIntyre	.87	1,820

Daily Mean Gage Height, in feet, of West Branch Susquehanna River at Williamsport, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.39	0.85	4.76	2.83	3.42	3.88	4.30	5.56	5.41	1.75	2.05	0.52
2	4.28	.90	5.63	2.87	3.13	4.19	4.69	5.77	4.46	1.77	1.67	.51
3	4.05	1.40	5.57	3.00	2.82	4.86	4.68	5.46	3.81	1.53	1.55	.52
4	3.20	2.03	5.58	3.20	2.67	6.68	4.62	5.29	3.24	1.14	1.59	.51
5	2.66	2.20	5.54	3.00	2.55	7.15	4.35	6.57	3.01	.92	2.04	.58
6	2.24	2.06	5.15	2.90	3.00	6.54	4.06	9.05	2.66	.94	2.10	.57
7	1.94	1.82	4.73	2.91	3.32	7.71	3.78	8.88	2.37	1.16	1.98	.72
8	1.71	1.60	4.40	2.83	3.46	10.82	3.50	7.57	2.17	.83	2.44	.95
9	1.52	1.48	3.94	3.18	3.54	11.52	3.53	6.45	1.99	.80	5.90	1.16
10	1.29	1.46	3.62	3.82	3.50	11.24	3.67	5.57	1.79	1.01	4.66	.88
11	1.24	1.40	3.40	3.41	3.80	9.67	3.60	4.90	1.66	1.17	3.27	1.08
12	1.20	1.39	3.27	3.32	3.90	8.17	3.46	4.37	1.66	1.30	2.84	2.25
13	1.18	1.28	3.07	3.36	3.64	7.75	3.28	4.35	1.82	1.54	2.47	2.79
14	1.11	1.22	4.12	2.66	3.40	7.62	3.18	4.35	1.69	1.67	2.27	2.04
15	1.04	1.16	7.43	2.47	3.53	7.14	3.10	4.04	1.41	1.61	2.27	1.57
16	.96	1.09	7.66	2.55	3.71	6.76	3.14	3.67	1.24	1.42	1.95	1.25
17	.86	2.41	6.59	2.36	5.57	6.66	3.38	3.42	1.12	1.23	1.67	1.11
18	.84	3.72	5.75	2.90	7.23	6.56	3.56	3.17	1.06	1.08	1.67	1.49
19	.84	3.66	5.10	1.76	6.55	5.92	3.44	3.01	1.00	1.01	1.74	3.58
20	.74	3.49	4.36	1.33	5.89	5.50	3.36	2.80	1.08	1.15	1.92	2.98
21	.74	3.51	3.56	1.33	5.19	5.12	3.19	2.61	.97	1.27	1.43	2.54
22	.69	4.33	3.25	2.89	4.57	4.93	3.03	2.45	.86	1.45	1.20	5.17
23	.66	5.83	3.43	4.28	4.18	4.54	3.78	2.38	.82	1.09	1.07	7.57
24	.66	7.95	4.04	5.46	3.92	4.28	7.12	2.90	.78	.93	1.01	5.68
25	.64	8.17	4.20	6.08	3.45	4.38	6.67	3.02	.72	.82	.89	4.32
26	.64	7.35	3.82	4.20	2.99	4.40	5.90	2.80	.70	.71	.83	3.58
27	.66	6.49	3.24	3.37	2.98	4.18	5.34	2.68	.68	.62	.75	3.23
28	.99	5.91	3.07	3.04	3.16	4.00	5.05	2.50	.65	.60	.74	2.74
29	.95	5.26	3.07	3.09	-------	4.08	4.64	3.98	.84	.66	.66	2.42
30	.96	4.67	2.76	3.06	-------	4.03	5.10	5.83	1.19	.95	.64	2.18
31	.93	------	2.76	3.58	-------	3.90	-------	6.17	-------	1.59	.56	-------

NOTE—Stage-discharge relation Jan. 18 and 19 affected by ice.

Daily discharge, in second-feet, of West Branch Susquehanna River at Williamsport, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,750	1,780	12,800	6,000	7,750	9,350	10,800	16,200	15,400	3,580	4,020	1,230
2	10,800	1,860	16,200	6,280	6,850	10,400	12,300	17,200	11,500	3,580	3,370	1,230
3	9,690	2,770	16,200	6,560	6,000	13,200	12,300	15,800	9,020	2,960	3,160	1,230
4	7,140	4,020	16,200	7,140	5,730	21,400	11,900	14,900	7,140	2,220	3,160	1,230
5	5,730	4,490	15,800	6,560	5,470	23,900	11,200	20,900	6,560	1,860	4,020	1,380
6	4,490	4,260	14,500	6,280	6,560	20,400	10,000	33,500	5,730	1,950	4,260	1,300
7	3,800	3,580	12,300	6,280	7,440	26,400	9,020	32,900	4,980	2,400	4,020	1,530
8	3,370	3,160	11,200	6,000	8,060	44,100	8,060	25,900	4,490	1,780	4,980	1,950
9	2,960	2,960	9,350	7,140	8,060	48,800	8,060	19,900	4,020	1,690	17,600	2,400
10	2,580	2,960	8,380	9,920	8,060	46,700	8,700	16,200	3,580	2,040	12,300	1,860
11	2,400	2,770	7,750	7,750	9,020	37,400	8,380	13,200	3,370	2,400	7,440	2,220
12	2,400	2,770	7,440	7,440	9,350	29,100	8,060	11,200	3,370	2,580	6,060	4,490
13	2,400	2,580	6,850	7,750	8,380	27,000	7,440	11,200	3,580	2,960	5,220	6,000
14	2,220	2,400	10,000	5,730	7,750	25,900	7,140	11,200	3,370	3,370	4,730	4,020
15	2,040	2,400	24,900	5,220	8,060	23,400	6,850	9,690	2,770	3,160	4,730	3,160
16	1,950	2,220	26,400	5,470	8,700	21,900	6,850	8,700	2,400	2,770	4,020	2,400
17	1,780	4,980	20,900	4,980	16,200	21,400	7,750	7,750	2,220	2,400	3,370	2,220
18	1,780	8,700	17,200	3,600	23,900	20,900	8,380	7,140	2,220	2,220	3,370	2,960
19	1,780	8,700	14,000	2,800	20,900	17,600	7,750	6,560	2,040	2,040	3,370	8,380
20	1,610	8,060	11,200	2,580	17,600	15,800	7,750	6,000	2,220	2,400	3,800	6,560
21	1,610	8,060	8,380	2,580	14,500	14,000	7,140	5,470	1,950	2,580	2,770	5,220
22	1,530	10,800	7,140	6,280	11,900	13,200	6,560	4,980	1,780	2,770	2,400	14,500
23	1,460	17,200	7,750	10,800	10,400	11,500	9,020	4,980	1,690	2,220	2,220	25,900
24	1,460	28,000	9,690	15,800	9,350	10,800	23,400	6,280	1,690	1,950	2,040	16,700
25	1,460	29,100	10,400	18,500	7,750	11,200	21,400	6,560	1,530	1,690	1,800	10,800
26	1,460	24,900	9,020	10,400	6,560	11,200	17,600	6,000	1,530	1,530	1,780	8,380
27	1,460	20,400	7,140	7,750	6,560	10,400	14,900	5,730	1,530	1,380	1,610	7,140
28	2,040	17,600	6,850	6,560	7,140	9,690	13,600	5,220	1,460	1,380	1,610	5,730
29	1,950	14,900	6,850	6,850	-------	10,000	11,900	9,690	1,780	1,460	1,460	4,980
30	1,950	12,300	6,000	6,850	-------	9,690	14,000	17,200	2,400	1,950	1,460	4,490
31	1,950	-------	6,000	8,380	-------	9,350	-------	19,000	-------	3,160	1,300	-------

NOTE—Discharge Jan. 18 and 19 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for West Branch Susquehanna River at Renovo.

Monthly discharge of West Branch Susquehanna River at Williamsport, for the year ending Sept. 30, 1921

(Drainage area 5,670 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	10,800	1,460	3,130	0.552	0.64
November	29,100	1,780	8,690	1.53	1.71
December	26,400	6,000	11,800	2.08	2.40
January	18,500	2,580	7,140	1.26	1.45
February	23,900	5,470	9,790	1.73	1.80
March	48,800	9,350	20,200	3.56	4.10
April	23,400	6,560	10,600	1.87	2.09
May	33,500	4,980	12,800	2.26	2.61
June	15,400	1,460	3,910	.690	.77
July	3,580	1,380	2,340	.413	.48
August	17,600	1,300	4,110	.725	.84
September	25,900	1,230	5,390	.951	1.06
The year	48,800	1,230	8,320	1.47	19.95

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG

Location.—At six-span steel highway bridge, Market Street, Lewisburg, Union County.

Drainage Area.—6,830 square miles.

Records Available.—September 21, 1913, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to hundredths twice daily by T. E. Irland; during high stages more frequently. Elevation of gage zero 427.9 feet, United States Geological Survey datum.

Channel and Control.—Right bank is high and not subject to overflow; left is of medium height and is overflowed during extremely high stages. The bed is composed of gravel.

Extremes of Stage.—Maximum gage height during the year, estimated from hydrograph, 10.5 feet at noon March 10; minimum, —0.13 foot from 5 p. m. September 4 to 7 a. m. September 5.

Ice.—Stage-discharge relation usually affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

Daily Mean Gage Height, in feet, of West Branch Susquehanna River at Lewisburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.19	0.41	3.61	1.82	2.35	2.62	2.84	4.36	3.87	0.96	0.83	0.01
2	3.14	.37	4.95	1.78	1.98	3.15	3.30	4.60	3.13	1.02	.88	−.03
3	2.98	.88	4.82	1.98	1.83	3.68	3.27	4.30	2.51	.83	.87	−.09
4	2.25	1.27	4.56	2.06	1.74	5.24	3.14	4.09	2.45	.61	.79	−.11
5	1.68	1.37	4.45	1.91	1.51	5.92	3.02	4.83	1.98	.42	.76	−.12
6	1.39	1.30	4.41	1.82	1.91	5.46	2.85	6.82	1.65	.37	1.04	−.01
7	1.19	1.11	3.65	1.84	2.14	5.89	2.62	7.28	1.43	.50	1.00	.00
8	1.00	.93	3.26	1.77	2.09	8.72	2.41	6.05	1.28	.37	1.02	.06
9	.88	.88	2.90	1.85	2.28	9.93	2.27	5.07	1.14	.29	2.87	.30
10	.76	.82	2.58	2.22	2.20	10.12	2.36	4.26	1.01	.38	3.42	.27
11	.65	.76	2.39	2.50	2.40	8.95	2.31	3.59	.91	.58	2.16	.17
12	.63	.78	2.22	2.03	2.58	7.31	2.24	3.10	.88	.64	1.68	.46
13	.59	.76	2.07	1.93	2.36	6.30	2.09	3.14	.87	.68	1.56	1.51
14	.62	.68	3.11	1.91	2.25	6.23	1.97	3.17	.86	.75	1.38	1.16
15	.54	.65	6.82	1.62	2.26	5.89	1.95	2.99	.73	.87	1.16	.78
16	.42	.61	6.49	1.48	2.44	5.53	1.94	2.62	.61	.71	.96	.56
17	.34	1.74	5.55	1.68	3.31	5.38	2.08	2.32	.53	.57	.89	.38
18	.30	3.03	4.70	1.27	5.44	5.16	2.36	2.13	.41	.44	.89	.39
19	.30	2.85	3.93	2.89	5.13	4.71	2.29	1.94	.42	.38	.97	1.46
20	.25	2.55	3.32	3.52	4.39	4.15	2.18	1.79	.40	.49	.95	1.88
21	.24	2.41	2.72	3.43	3.70	3.87	2.04	1.63	.33	.55	.86	1.39
22	.22	2.70	2.35	2.04	3.27	3.55	1.95	1.50	.29	.58	.63	1.99
23	.18	4.06	2.32	2.94	2.94	3.25	2.56	1.43	.29	.54	.51	5.44
24	.14	5.91	2.38	3.56	2.68	3.03	5.99	1.58	.26	.41	.42	4.31
25	.11	6.60	2.76	4.28	2.36	3.23	5.74	1.90	.21	.23	.32	3.00
26	.12	5.96	2.43	3.28	2.03	3.19	4.84	1.72	.20	.18	.24	2.32
27	.12	5.17	2.27	2.31	1.93	3.04	4.12	1.63	.17	.09	.17	1.94
28	.55	4.53	2.12	1.89	2.11	2.84	3.77	1.47	.21	.04	.09	1.63
29	.62	3.95	1.92	1.88	------	2.86	3.36	2.12	.41	.12	.07	1.35
30	.47	3.44	1.67	1.86	------	2.82	3.54	3.49	.49	.33	.04	1.13
31	.45	------	1.68	2.00	------	2.68	------	4.33	------	.35	.04	------

NOTE—Stage-discharge relation Jan. 1922 affected by ice.

SUSQUEHANNA BASIN—STATION NO. 27

SUSQUEHANNA RIVER AT SUNBURY

Location.—At twenty-eight-span steel bridge, Philadelphia & Reading Railway Company, Sunbury, Northumberland County.

Drainage Area.—18,200 square miles.

Records Available.—August 9, 1916, to September 30, 1921.

Gages.—Staff painted on left face of first pier, graduated to two hundredths between zero and 3.3 feet and to half feet above 3.0 feet. Read to hundredths between zero and 3.3 feet and to inches above 3.3 feet twice daily by W. E. Bayler; during high stages more frequently. Bristol water stage recorder installed on top, upstream end, of first pier. Zero elevation of both gages 420.00 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of highway bridge about 3,700 feet below gage.

Channel and Control.—Both banks are high but subject to overflow during extreme floods. Bed is composed of gravel and rock. Control is the remaining portion of the old Shamokin Dam about 6,800 feet below gage; permanent.

Extremes of Stage.—Maximum gage height during the year, 10.33 feet observed at 5 p. m. March 10; minimum, —0.06 foot at 5 p. m. September 5.

Ice.—Stage-discharge relation usually affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

The following discharge measurement was made by J. M. Snavely and H. L. Landis: No. 3, June 20: Gage height, 0.47 foot; discharge, 5,200 second-feet.

Daily Mean Gage Height, in feet, of Susquehanna River at Sunbury, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.26	1.30	4.00	2.10	2.20	3.10	3.67	3.83	2.62	0.65	0.65	0.12
2	5.29	1.30	4.50	2.20	1.95	4.11	3.83	4.25	2.43	.77	.78	.07
3	5.25	1.55	5.75	2.28	1.90	5.53	4.12	4.50	2.10	.76	1.08	.03
4	4.54	2.10	6.50	2.43	1.74	6.86	4.08	4.50	2.13	.73	1.09	-.01
5	3.67	2.05	6.38	2.74	1.68	7.33	3.75	4.58	1.90	.68	.98	-.05
6	2.90	1.89	5.40	2.75	1.90	6.25	3.40	5.12	1.65	.63	1.00	.05
7	2.50	1.78	5.17	2.70	2.03	5.62	3.15	5.50	1.38	.45	.93	.17
8	2.18	1.64	4.75	2.58	2.09	7.42	3.02	5.00	1.15	.40	1.25	.35
9	1.90	1.53	4.54	2.49	2.18	9.23	2.85	4.33	1.07	.31	1.90	.40
10	1.73	1.42	4.17	2.50	2.20	10.00	2.65	3.80	1.00	.22	2.30	.40
11	1.61	1.37	3.62	2.51	2.20	9.42	2.60	3.25	.91	.48	1.73	.33
12	1.47	1.27	3.15	2.40	2.20	7.88	2.53	2.85	.82	.73	1.22	.38
13	1.38	1.19	2.96	2.15	2.11	6.88	2.42	2.80	.80	.77	1.08	.88
14	1.28	1.15	3.44	2.03	1.99	6.25	2.32	2.90	.77	.70	1.16	.83
15	1.18	1.11	6.19	1.92	2.05	6.29	2.20	2.68	.73	.69	1.16	.56
16	1.05	1.10	6.75	2.04	2.13	5.75	2.11	2.45	.69	.83	1.08	.43
17	.99	1.70	6.34	2.08	2.60	5.46	2.18	2.25	.65	.90	1.01	.37
18	.95	2.80	5.50	1.80	4.22	5.25	2.40	2.00	.60	.75	.97	.33
19	.92	3.35	4.80	1.59	5.29	4.92	2.40	1.82	.55	.88	.96	.65
20	.90	3.50	3.88	1.15	4.54	4.42	2.25	1.67	.51	1.45	.93	1.17
21	.83	3.15	3.36	1.05	3.75	4.16	2.40	1.65	.47	1.36	.89	.95
22	.72	3.00	3.03	1.55	3.18	3.96	2.50	1.53	.40	1.21	.78	1.21
23	.75	3.54	2.90	2.50	2.94	3.92	2.57	1.46	.35	1.05	.67	3.10
24	.69	4.69	3.10	2.90	2.67	3.92	5.02	1.55	.31	.94	.61	2.65
25	.65	6.17	3.10	3.00	2.45	3.66	6.22	1.64	.27	.89	.57	2.05
26	.61	6.17	3.10	2.78	2.25	3.96	5.57	1.57	.23	.85	.53	1.65
27	.58	5.34	2.90	2.35	2.05	3.75	4.66	1.54	.19	.81	.45	1.35
28	.75	4.67	2.65	1.90	2.20	3.67	4.08	1.51	.15	.65	.36	1.16
29	1.10	4.21	2.45	1.72	-------	3.67	3.62	1.69	.34	.51	.31	1.01
30	1.00	4.04	2.45	1.70	-------	3.67	3.50	2.21	.46	.53	.27	.84
31	1.25	-------	2.25	2.24	-------	3.67	-------	2.78	-------	.50	.20	-------

SUSQUEHANNA BASIN—STATION NO. 28

FRANKSTOWN BRANCH JUNIATA RIVER AT WILLIAMSBURG

Location.—At two-span steel highway bridge, Williamsburg, Blair County.

Drainage Area.—295 square miles.

Records Available.—October 24, 1916, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by R. E. Rhule. Elevation of gage zero 831.78 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high but subject to overflow at extremely high stages. Bed is composed of mud, gravel and small boulders. Control for low stages is a water main crossing the stream diagonally about 150 feet below gage; permanent. Medium and high stage control is at the first of a series of riffles about 450 feet below the water main; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 10.7 feet at 10 a. m. May 5 (discharge, about 7,400 second-feet); minimum, 1.65 feet at 4 p. m. September 16 (discharge, 85 second-feet).

Ice.—Stage-discharge relation rarely affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined between 70 and 2,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Frankstown Branch Juniata River at Williamsburg, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
13	May 6	H. J. McIntyre	7.05	2,630
14	6	H. J. McIntyre	6.92	2,530
15	June 29	H. J. McIntyre	3.00	368

Daily Mean Gage Height, in feet, of Frankstown Branch Juniata River at Williamsburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.95	1.75	3.98	2.56	2.96	3.85	2.86	3.12	2.26	2.12	2.04	1.68
2	3.08	1.95	3.74	2.62	2.78	4.26	2.54	3.26	2.20	2.30	3.32	1.66
3	2.72	2.69	3.50	2.73	2.72	6.73	2.44	3.17	2.18	2.02	5.09	1.81
4	2.51	2.06	3.38	2.56	2.72	6.09	2.38	4.92	2.16	1.84	3.92	1.84
5	2.40	1.92	3.39	2.62	3.18	4.98	2.30	9.75	2.11	1.82	3.05	2.28
6	2.29	1.88	3.19	2.70	3.38	4.58	2.30	6.78	2.02	1.80	2.78	2.18
7	2.22	1.85	2.99	2.56	3.20	4.94	2.30	5.24	2.00	1.78	4.66	2.67
8	2.17	1.91	2.78	3.79	3.27	4.45	2.30	4.55	2.00	1.78	3.77	1.89
9	2.12	1.90	2.74	3.34	3.80	4.24	2.84	4.00	2.00	2.33	2.94	1.85
10	2.08	1.88	2.69	3.17	3.82	4.30	2.56	3.65	1.98	3.62	2.64	2.00
11	2.01	1.84	2.74	3.05	3.85	3.88	2.45	3.40	1.95	3.70	2.48	2.29
12	1.97	1.78	2.60	2.96	3.64	3.71	2.40	3.38	1.95	2.97	2.42	1.98
13	1.95	1.76	2.58	2.68	3.38	4.42	2.40	3.49	1.88	2.72	2.34	1.80
14	1.92	1.76	4.84	2.35	3.58	3.74	2.40	3.59	1.83	2.28	2.10	1.75
15	1.90	1.78	4.38	2.88	3.45	4.22	2.46	3.56	1.80	2.26	2.14	1.71
16	1.87	1.93	3.88	2.96	3.44	3.92	2.41	3.38	1.79	2.24	2.03	1.68
17	1.87	4.38	3.58	2.28	3.58	3.75	2.49	3.22	1.78	2.02	2.01	1.73
18	1.87	3.33	3.30	2.00	3.12	3.67	2.37	3.06	2.04	1.89	2.18	2.33
19	1.82	3.11	3.06	2.10	3.05	3.40	2.34	2.92	1.83	2.19	2.00	1.88
20	1.80	3.95	2.86	2.26	2.68	3.32	2.29	2.80	1.76	3.33	1.91	1.78
21	1.80	4.07	2.59	3.08	3.06	3.21	2.29	2.68	1.74	2.40	1.88	2.22
22	1.80	3.96	2.70	5.50	3.13	3.11	2.20	2.60	1.72	2.16	1.80	3.34
23	1.75	5.27	3.78	5.95	2.94	2.95	3.78	2.60	1.72	2.06	1.80	2.56
24	1.75	4.46	3.44	4.66	2.92	2.89	3.39	2.50	1.85	1.98	1.80	2.22
25	1.75	4.08	3.06	3.91	2.60	2.92	2.92	2.75	1.76	1.88	1.80	2.16
26	1.80	3.67	3.26	3.32	2.66	2.78	2.78	2.53	1.78	2.29	1.78	2.15
27	1.85	3.45	2.94	2.89	2.68	2.71	2.74	2.39	2.00	2.30	1.75	2.00
28	1.85	3.32	2.84	2.80	3.58	2.62	2.72	2.37	2.05	2.05	1.72	1.93
29	1.85	3.10	2.82	2.90	------	2.51	2.97	3.12	2.48	3.27	1.70	1.86
30	1.80	2.92	2.64	2.98	------	2.47	3.15	2.68	2.82	2.61	1.70	1.85
31	1.80	------	2.63	3.50	------	2.47	------	2.36	------	2.32	1.68	------

Daily discharge, in second-feet, of Frankstown Branch Juniata River at Williamsburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	767	103	767	272	380	682	351	425	204	171	160	90
2	425	140	640	284	337	900	272	492	193	215	492	86
3	310	310	564	324	310	2,520	248	457	193	150	1,340	114
4	260	160	527	272	310	2,030	237	1,220	182	119	724	119
5	237	134	527	284	457	1,280	215	5,980	171	115	395	215
6	215	126	457	310	527	1,050	215	2,600	150	112	337	193
7	193	121	395	272	457	1,220	215	1,400	150	109	1,100	297
8	182	132	337	682	492	950	215	1,050	150	109	682	128
9	171	130	324	492	682	855	351	767	150	226	380	121
10	171	126	316	457	682	900	272	602	146	602	297	150
11	150	119	324	395	682	724	248	527	140	640	260	215
12	144	109	284	380	602	640	237	527	140	380	237	146
13	140	105	284	310	527	950	237	564	126	310	226	112
14	134	105	1,160	226	602	640	237	602	117	215	193	103
15	130	109	950	365	527	855	248	602	112	204	182	96
16	124	136	724	380	527	724	237	527	110	204	160	90
17	124	950	602	215	602	682	260	457	109	150	150	100
18	124	492	492	150	425	640	226	425	160	128	193	226
19	115	425	425	171	395	527	226	365	117	193	150	126
20	112	767	351	204	310	492	215	337	105	492	132	109
21	112	811	284	425	425	457	215	310	102	237	126	193
22	112	767	310	1,590	425	425	215	284	98	182	112	492
23	103	1,460	682	1,950	380	380	682	284	98	160	112	272
24	103	1,000	527	1,100	365	365	527	260	121	146	112	193
25	103	811	425	724	284	365	365	324	105	126	112	182
26	112	640	492	492	297	337	337	272	109	215	109	182
27	121	527	380	365	310	310	324	237	150	215	103	150
28	121	492	351	337	602	284	310	226	160	160	98	136
29	121	425	337	365	-------	260	380	425	260	492	94	123
30	112	365	297	395	-------	248	457	310	337	284	94	121
31	112	-------	297	564	-------	248	-------	226	-------	215	90	-------

Monthly discharge of Frankstown Branch Juniata River at Williamsburg, for the year ending Sept. 30, 1921

(Drainage area 295 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	767	103	176	0.597	0.69
November	1,460	103	403	1.37	1.53
December	1,160	284	478	1.62	1.87
January	1,950	150	476	1.61	1.86
February	682	284	461	1.56	1.62
March	2,520	248	740	2.51	2.89
April	682	215	292	.990	1.10
May	5,980	226	745	2.53	2.92
June	337	98	149	.505	.56
July	640	109	235	.797	.92
August	1,340	90	289	.980	1.13
September	492	86	163	.553	.62
The year	5,980	86	385	1.31	17.71

SUSQUEHANNA BASIN—STATION NO. 29

LITTLE JUNIATA RIVER AT TYRONE

Location.—At single-span steel highway bridge, Pennsylvania Avenue, Tyrone, Blair County.

Drainage Area.—107 square miles.

Records Available.—August 22, 1918, to December 31, 1919, and April 1, 1920, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to hundredths twice daily by H. W. Waple; during high stages more frequently. Elevation of gage zero 877.04 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high. Bed is composed of gravel and rock. Control is at a riffle about 700 feet below gage. Stage-discharge relation for medium and high stages is affected by backwater from Bald Eagle Creek, which confluences with the Little Juniata about 200 feet below gage.

Extremes of Stage.—Maximum gage height during the year, estimated from hydrograph, 5.9 feet at 6 a. m. May 5; minimum, 0.98 foot at 4.30 p. m. July 24 and 5.15 p. m. September 1.

Ice.—Stage-discharge relation usually affected by ice.

Gage heights obtained at this station are for Flood Warning purposes.

The following discharge measurement was made by H. J. McIntyre: No. 3, June 29: Gage height, 1.37 feet; discharge, 49.8 second-feet.

Daily Mean Gage Height, in feet, of Little Juniata River, at Tyrone, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.88	1.18	3.25	1.92	2.08	2.73	2.19	2.72	1.59	1.78	1.10	0.98
2	2.30	1.52	3.07	1.97	1.99	2.87	2.07	2.72	1.52	1.64	1.77	1.00
3	2.25	1.87	2.87	2.00	1.96	4.05	2.01	2.56	1.50	1.35	2.52	1.02
4	2.05	1.57	2.81	1.96	1.96	3.86	2.00	3.30	1.60	1.23	1.84	1.08
5	1.86	1.33	2.75	2.46	2.11	3.27	2.00	5.40	1.48	1.19	1.56	1.50
6	1.81	1.27	2.65	3.16	2.26	3.09	1.96	4.20	1.40	1.20	1.47	1.26
7	1.76	1.35	2.53	3.11	2.16	3.73	1.92	3.61	1.38	1.18	2.70	1.16
8	1.70	1.39	2.41	2.84	2.24	3.44	1.89	3.20	1.40	1.20	2.41	1.08
9	1.64	1.46	2.33	2.36	2.44	3.33	2.26	2.91	1.37	1.18	2.04	1.04
10	1.59	1.43	2.26	2.32	2.41	3.25	2.08	2.71	1.34	1.24	1.81	1.04
11	1.56	1.39	2.21	2.18	2.48	3.05	2.00	2.58	1.39	1.37	1.70	1.34
12	1.52	1.33	2.12	2.08	2.24	2.95	1.98	2.75	1.38	1.39	1.69	1.18
13	1.48	1.31	2.24	2.04	2.23	3.02	1.97	2.66	1.35	1.32	1.56	1.06
14	1.42	1.29	4.44	2.08	2.32	2.88	1.94	2.60	1.24	1.18	1.58	1.02
15	1.40	1.31	3.52	2.04	2.44	2.89	1.98	2.45	1.17	1.21	1.45	1.00
16	1.38	1.71	3.12	1.90	2.50	3.05	1.89	2.34	1.16	1.18	1.36	1.10
17	1.37	3.96	2.82	1.71	2.72	2.73	1.92	2.26	1.22	1.08	1.40	1.42
18	1.36	3.72	2.62	1.51	2.44	2.63	1.84	2.15	1.42	1.02	1.48	1.65
19	1.36	3.52	2.42	1.41	2.38	2.55	1.79	2.07	1.20	1.34	1.32	1.28
20	1.35	3.39	2.25	1.71	2.48	2.48	1.74	1.95	1.16	1.36	1.20	1.20
21	1.32	3.21	2.19	2.58	2.51	2.41	1.72	1.81	1.12	1.12	1.17	2.55
22	1.29	3.13	2.16	2.66	2.24	2.35	1.75	1.83	1.09	1.02	1.13	2.25
23	1.27	3.95	2.47	3.86	2.15	2.23	2.80	1.88	1.22	1.00	1.14	1.82
24	1.26	3.47	2.19	3.24	2.14	2.15	2.73	1.79	1.22	.98	1.12	1.58
25	1.26	3.28	2.06	2.68	2.24	2.25	2.60	1.96	1.10	1.04	1.10	1.59
26	1.22	3.21	1.99	2.41	2.04	2.13	2.50	1.76	1.62	1.03	1.08	1.46
27	1.39	3.12	2.15	2.51	2.08	2.07	2.47	1.68	1.62	1.02	1.04	1.42
28	1.45	2.92	2.02	2.41	2.54	2.03	2.62	1.70	1.40	1.00	1.02	1.38
29	1.30	2.72	1.88	2.31	------	1.95	3.15	1.82	1.33	1.85	1.01	1.32
30	1.26	2.62	1.95	2.31	------	1.93	2.76	1.72	1.60	1.50	1.00	1.28
31	1.24	------	1.89	2.36	------	1.95	------	1.66	------	1.22	1.00	------

SUSQUEHANNA BASIN—STATION NO. 30

FRANKSTOWN BRANCH JUNIATA RIVER AT HUNTINGDON

Location.—At three-span steel highway bridge known as Smithfield Bridge, Huntingdon, Huntingdon County.

Drainage Area.—845 square miles.

Records Available.—September 29, 1915, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to half-tenths thrice daily by Lawrence White. Elevation of gage zero 599.10 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high but subject to overflow at extremely high stages. Bed is composed of gravel and rocks. Control is a fish trap wall, about 800 feet below gage, which was constructed during the fall of 1919.

Extremes of Stage.—Maximum gage height during the year, 9.55 feet observed at noon May 5; minimum, 0.65 foot at 8 a. m. October 23, 30, July 8, 9 and September 30.

Ice.—Stage-discharge relation not seriously affected by ice.

Regulation.—There are large fluctuations in daily stage during low flows caused by the operation of a power plant about four miles above the gage.

Discharge measurements of Frankstown Branch Juniata River at Huntingdon, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
65	Oct. 26	R. J. Ferris	0.95	191
66	June 30	H. L. Landis and H. J. McIntyre	2.18	780

Daily Mean Gage Height, in feet, of Frankstown Branch Juniata River at Huntingdon, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.10	0.80	2.83	2.25	-------	3.18	2.65	3.02	1.90	2.50	1.55	0.78
2	3.12	1.50	3.28	2.08	2.90	3.71	2.07	3.10	1.72	1.83	2.08	1.47
3	2.13	2.90	3.10	2.03	2.35	5.33	2.20	2.91	1.97	1.72	3.23	1.07
4	2.30	2.47	2.95	2.42	1.97	5.52	2.30	4.74	1.47	1.20	3.25	.80
5	2.80	2.13	2.93	2.38	2.20	4.58	1.98	8.97	1.27	1.94	-------	1.82
6	2.23	1.10	3.12	2.03	3.22	4.23	2.18	6.62	1.58	1.12	1.77	1.75
7	2.00	2.07	2.87	2.33	2.23	4.52	2.18	5.18	1.67	1.24	2.32	2.48
8	2.60	1.40	2.67	2.42	2.47	4.40	2.20	4.60	1.57	1.62	3.33	1.75
9	2.62	2.13	2.63	2.63	2.50	4.03	2.50	3.78	1.48	1.52	2.65	1.15
10	1.87	1.62	2.60	2.42	3.18	4.30	1.95	3.43	1.58	2.25	2.03	1.73
11	1.97	1.75	2.57	2.72	2.98	3.52	1.52	3.22	1.65	2.52	1.68	1.55
12	2.10	2.10	2.47	2.62	3.02	3.35	1.93	3.12	1.57	2.40	2.22	1.98
13	2.00	1.30	1.93	2.47	2.72	3.88	2.30	3.93	1.60	2.50	1.50	1.33
14	1.97	1.18	4.12	-------	2.87	3.40	2.02	3.66	1.73	-------	.83	1.07
15	1.83	1.33	4.44	3.00	3.07	3.53	2.25	3.22	1.70	-------	1.50	1.67
16	1.57	1.71	3.72	1.85	2.72	3.57	1.88	3.02	1.45	-------	1.35	1.40
17	1.57	4.36	3.18	2.45	2.98	3.33	2.22	2.97	2.32	-------	1.83	1.13
18	1.83	3.50	3.07	1.90	2.80	3.22	2.32	2.85	1.72	-------	1.95	1.42
19	1.83	2.98	2.52	1.78	2.63	3.07	1.88	2.85	1.37	-------	1.90	1.48
20	1.70	3.00	2.30	1.97	2.82	2.98	1.88	2.77	.88	-------	1.93	1.37
21	1.75	4.07	2.38	2.33	-------	2.90	1.68	2.70	1.50	-------	.77	1.73
22	1.57	3.45	2.20	4.52	3.08	2.77	1.78	2.23	1.48	-------	1.65	3.57
23	1.02	4.17	2.68	5.30	2.55	2.73	2.35	2.50	1.40	1.70	1.48	2.35
24	1.60	4.17	3.07	4.36	2.47	2.50	3.03	2.25	1.78	.78	1.42	2.10
25	1.63	3.80	2.33	3.45	2.17	2.67	2.65	2.55	-------	1.80	1.50	.70
26	.80	3.65	2.60	3.07	2.30	2.58	2.58	2.40	1.72	1.58	1.27	1.88
27	2.23	3.40	2.30	2.87	2.22	2.10	2.38	2.30	2.40	1.68	1.80	1.67
28	2.00	3.17	2.58	2.70	2.60	2.70	2.57	1.98	1.83	1.67	.72	.93
29	1.97	3.08	2.47	2.55	-------	2.50	2.80	2.42	1.95	2.30	1.37	1.52
30	1.65	2.83	2.30	2.50	-------	2.00	3.27	2.35	2.95	1.90	1.32	1.42
31	1.82	-------	2.18	2.60	-------	1.93	-------	1.73	-------	1.12	1.33	-------

NOTE—Gage height not observed on days of no record.

SUSQUEHANNA BASIN—STATION NO. 31

RAYSTOWN BRANCH JUNIATA RIVER AT SAXTON

Location.—At two-span steel highway bridge, Saxton, Bedford County.

Drainage Area.—790 square miles.

Records Available.—August 31, 1911, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by D. R. Jenkins. Elevation of gage zero 789.91 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Banks are subject to overflow during high stages. Control was at a heavy boulder riffle about 350 feet below gage until about the first of February, when a new one was formed by the reconstruction of the H. & B. T. M. R. R. bridge about 250 feet below the gage.

Extremes of Discharge.—Maximum stage during the year, 8.23 feet observed at 5 p. m. May 5 (discharge, 10,200 second-feet): minimum, 1.30 feet from 5 p. m. September 1 to 7 a. m. September 3 (discharge, 115 second-feet); a stage of 1.09 feet was observed at 5 p. m.

November 14, but the discharge was more than the low flow in September due to change of control.

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation changed February 1, when new control became effective; also affected by ice. Two rating curves used; one applicable to January 31 fairly well defined below 1,000 second-feet and well defined between 1,000 and 22,000 second-feet; the other applicable from February 1 well defined between 150 and 1,000 second-feet and fairly well defined from 1,000 to 12,000 second feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except those for low stages, which are fair.

Discharge Measurements of Raystown Branch Juniata River at Saxton, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
39	June 30	H. L. Landis	2.52	539
40	30	H. J. McIntyre	2.72	690

Daily Mean Gage Height, in feet, of Raystown Branch Juniata River at Saxton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.41	1.20	2.57	2.21	3.54	4.31	2.42	3.03	2.58	4.08	1.65	1.32
2	2.06	1.19	3.10	2.21	3.25	5.00	2.36	3.08	2.55	4.18	1.70	1.30
3	1.60	1.54	3.12	2.20	3.06	6.24	2.34	3.15	2.44	3.38	2.21	1.36
4	1.69	1.73	2.99	2.16	3.06	6.55	2.35	3.65	2.44	2.75	3.84	1.51
5	1.62	1.57	2.94	2.13	3.51	5.68	2.27	7.25	2.21	2.43	3.17	2.12
6	1.52	1.36	2.82	2.08	3.62	4.85	2.22	7.08	1.98	2.25	2.65	2.31
7	1.42	1.36	2.59	2.13	3.51	4.41	2.15	6.09	1.86	2.40	2.51	2.12
8	1.36	1.36	2.46	2.20	3.41	4.25	2.11	4.46	1.79	2.13	2.76	2.20
9	1.34	1.31	2.36	3.02	3.51	4.11	2.41	4.08	1.74	1.94	2.65	1.88
10	1.34	1.27	2.19	2.76	3.73	3.83	2.61	3.68	1.69	2.25	2.30	1.73
11	1.34	1.23	2.14	2.66	4.01	3.68	2.48	3.41	1.67	2.78	2.13	1.66
12	1.33	1.19	2.14	2.54	3.93	3.28	2.35	3.53	1.69	3.08	2.01	1.59
13	1.29	1.15	2.06	2.46	3.74	3.35	2.31	4.67	1.62	2.94	1.98	1.66
14	1.26	1.10	2.32	2.22	3.51	3.43	2.28	4.58	1.48	2.54	1.99	1.57
15	1.24	1.14	4.02	1.99	3.41	3.44	2.30	4.15	1.44	2.32	1.87	1.51
16	1.23	1.27	4.00	2.20	3.23	3.58	2.35	3.85	1.40	2.26	1.77	1.43
17	1.22	2.33	3.49	2.72	3.18	3.75	2.38	3.58	1.49	2.49	1.73	1.40
18	1.21	2.26	2.99	2.84	3.12	3.68	2.38	3.33	2.13	2.16	1.82	1.48
19	1.17	2.62	2.72	2.78	2.88	3.48	2.34	3.10	2.31	2.10	1.95	1.42
20	1.15	2.99	2.46	2.44	2.80	3.49	2.36	2.98	1.95	2.02	1.98	1.48
21	1.14	4.04	2.19	2.33	2.65	3.33	2.27	2.78	1.71	1.97	1.76	1.91
22	1.17	4.22	2.04	3.86	2.93	3.13	2.22	2.68	1.61	1.96	1.65	3.03
23	1.15	4.04	3.15	4.89	2.88	2.98	2.62	2.57	1.57	1.84	1.59	3.18
24	1.14	4.14	3.34	4.75	2.63	2.78	2.88	2.52	1.72	1.70	1.54	2.53
25	1.15	3.72	2.94	4.47	2.58	2.58	2.88	2.53	1.78	1.63	1.48	2.27
26	1.15	3.36	2.77	3.43	2.55	2.58	2.72	2.88	1.82	1.76	1.50	2.24
27	1.14	3.09	2.68	3.02	2.71	2.59	2.66	2.83	1.94	1.60	1.47	2.15
28	1.52	2.89	2.60	2.79	3.36	2.53	2.59	2.62	2.35	1.61	1.38	2.03
29	1.44	2.75	2.38	2.78	------	2.53	2.66	2.45	2.78	1.63	1.36	1.86
30	1.40	2.44	2.16	2.86	------	2.48	3.03	2.71	2.84	1.70	1.37	1.81
31	1.27	------	2.16	3.08	------	2.51	------	2.57	------	1.63	1.34	------

NOTE—Stage-discharge relation Jan. 18-21 affected by ice.

Daily discharge, in second-feet, of Raystown Branch Juniata River at Saxton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	775	199	905	620	1,430	2,500	495	975	620	2,200	192	119
2	523	199	1,480	620	1,170	3,550	468	1,020	588	2,350	205	115
3	316	298	1,480	620	975	5,800	468	1,070	525	1,320	390	127
4	356	377	1,260	586	975	6,600	468	1,540	525	728	1,790	155
5	316	298	1,310	586	1,430	4,800	415	7,850	390	525	1,070	345
6	280	236	1,150	552	1,540	3,250	390	7,620	305	415	655	440
7	250	236	950	586	1,430	2,650	368	5,600	255	495	555	345
8	236	236	818	620	1,320	2,350	345	2,800	240	368	728	390
9	236	223	735	1,360	1,430	2,200	495	2,200	220	288	655	270
10	236	211	620	1,100	1,660	1,790	620	1,660	205	415	440	220
11	236	211	586	1,000	2,060	1,660	555	1,320	192	765	368	192
12	236	199	586	905	1,920	1,220	468	1,430	205	1,020	305	180
13	223	188	523	818	1,660	1,270	440	3,100	180	888	305	192
14	211	177	695	620	1,430	1,380	440	2,950	151	588	305	168
15	211	188	2,650	494	1,320	1,380	440	2,350	143	440	255	155
16	211	211	2,650	620	1,170	1,540	468	1,790	135	415	220	141
17	199	735	1,970	1,050	1,120	1,790	495	1,540	153	555	220	135
18	199	658	1,360	600	1,020	1,660	495	1,270	368	368	240	151
19	188	950	1,050	400	845	1,430	468	1,020	440	345	288	139
20	188	1,360	818	460	765	1,430	468	930	288	305	305	151
21	188	2,650	620	600	655	1,270	415	765	205	288	220	270
22	188	2,950	523	2,510	888	1,070	390	690	180	288	192	975
23	188	2,650	1,600	4,100	845	930	620	588	168	255	180	1,020
24	188	2,800	1,720	3,930	655	765	845	555	205	205	168	588
25	188	2,230	1,310	3,420	620	620	845	588	240	192	151	415
26	188	1,840	1,100	1,840	588	620	690	845	240	220	155	415
27	188	1,480	1,050	1,360	690	620	655	805	288	180	149	368
28	280	1,260	950	1,150	1,270	588	620	620	468	180	131	325
29	265	1,100	775	1,150	-------	588	655	525	765	192	127	255
30	250	818	586	1,200	-------	555	975	690	805	205	129	240
31	211	-------	586	1,480	-------	555	-------	588	-------	192	123	-------

NOTE—Discharge Jan. 18-21 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Frankstown Branch Juniata River at Williamsburg.

Monthly discharge of Raystown Branch Juniata River at Saxton, for the year ending Sept. 30, 1921

(Draining area 790 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	775	188	256	0.324	0.37
November	2,950	177	906	1.15	1.28
December	2,650	523	1,110	1.41	1.63
January	4,100	400	1,190	1.51	1.74
February	2,060	588	1,170	1.48	1.54
March	6,600	555	1,880	2.38	2.74
April	975	345	533	.675	.75
May	7,850	525	1,850	2.34	2.70
June	805	135	323	.409	.46
July	2,350	180	555	.703	.81
August	1,790	123	362	.458	.53
September	1,020	115	300	.380	.42
The year	7,850	115	872	1.10	14.97

SUSQUEHANNA BASIN—STATION NO. 32

TUSCARORA CREEK NEAR PORT ROYAL

Location.—At single-span steel highway bridge about two miles southwest of Port Royal, Juniata County.

Drainage Area.—205 square miles.

Records Available.—August 21, 1911, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Stuart Groninger.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are low but not subject to overflow except during extremely high stages. Bed is composed of gravel and rocks. Control is at a riffle about 500 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, 11.68 feet observed at 9.15 a. m. May 5 (discharge, about 8,600 second-feet); minimum, 2.07 feet at 7.30 a. m. September 4 (discharge, 8 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 15 and 5,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for extreme stages when they are fair.

Daily Mean Gage Height, in feet, of Tuscarora Creek near Port Royal, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.47	2.42	4.82	3.11	3.55	4.48	3.36	3.89	2.92	4.42	2.29	2.11
2	3.32	2.42	4.85	3.12	3.28	5.13	3.28	4.34	2.86	3.37	2.37	2.12
3	2.98	3.25	4.28	3.20	3.21	6.07	3.10	4.12	2.82	2.82	2.74	2.16
4	2.86	2.75	3.95	3.06	3.32	5.53	3.04	5.67	2.82	2.64	2.85	2.12
5	2.78	2.56	4.04	3.02	3.45	4.94	2.99	10.37	2.74	2.57	2.60	2.67
6	2.70	2.50	3.80	2.98	3.64	4.58	2.97	7.30	2.73	2.49	2.45	3.08
7	2.66	2.47	3.57	2.96	3.50	4.38	2.94	5.80	2.70	2.48	2.47	3.38
8	2.64	2.46	3.41	3.06	3.42	4.13	2.92	5.10	2.74	2.52	2.50	3.30
9	2.59	2.46	3.31	3.08	3.72	4.07	3.12	4.60	2.71	2.50	2.46	2.71
10	2.56	2.48	3.28	2.94	4.03	4.25	3.14	4.28	2.67	2.52	2.41	2.55
11	2.54	2.44	3.26	2.75	4.15	3.92	2.99	4.04	2.65	2.48	2.32	2.58
12	2.54	2.40	3.17	2.98	4.09	3.80	2.94	4.20	2.66	2.47	2.28	2.67
13	2.49	2.38	3.14	3.22	3.82	3.96	2.91	5.50	2.66	2.62	2.28	2.50
14	2.50	2.36	5.43	3.40	3.71	3.70	2.90	5.11	2.58	2.48	2.27	2.40
15	2.50	2.36	6.16	3.30	3.55	4.01	2.94	4.57	2.54	2.46	2.26	2.30
16	2.46	2.59	4.79	3.28	3.42	3.91	3.05	4.26	2.51	2.48	2.28	2.28
17	2.45	6.09	4.28	3.16	3.42	3.75	4.19	4.02	2.51	2.39	2.25	2.34
18	2.46	5.07	3.98	3.40	3.29	3.68	3.60	3.83	2.84	2.40	2.27	2.38
19	2.46	4.12	3.67	3.11	3.14	3.56	3.35	3.70	2.72	2.47	2.26	2.44
20	2.46	3.75	3.55	3.06	3.64	3.51	3.22	3.53	2.58	2.32	2.24	2.32
21	2.46	3.48	3.16	3.19	3.96	3.46	3.12	3.43	2.51	2.46	2.18	2.28
22	2.44	3.31	3.48	4.23	4.00	3.36	3.08	3.34	2.48	2.64	2.14	3.06
23	2.44	4.38	4.25	4.68	3.36	3.26	4.23	3.38	2.46	2.39	2.16	2.89
24	2.41	5.25	3.87	4.19	3.31	3.23	5.06	3.19	2.48	2.34	2.13	2.62
25	2.45	4.32	3.56	3.58	3.02	3.38	4.22	3.20	2.47	2.28	2.13	2.50
26	2.44	3.88	3.32	3.24	3.10	3.26	3.86	3.25	2.42	2.28	2.13	2.46
27	2.46	3.58	3.56	3.32	3.14	3.17	3.62	3.10	2.46	2.26	2.12	2.48
28	2.56	3.56	3.34	3.21	3.47	3.10	3.52	3.04	2.46	2.24	2.11	2.38
29	2.69	3.36	3.00	3.19	------	3.04	3.52	2.52	2.69	2.28	2.10	2.38
30	2.50	3.20	3.38	3.23	------	3.02	4.05	3.18	2.82	2.32	2.12	2.34
31	2.41	------	3.22	3.62	------	2.99	------	3.00	------	2.34	2.12	------

NOTE—Stage-discharge relation Jan. 12-20, Feb. 21 and 22 affected by ice.

Daily discharge, in second-feet, of Tuscarora Creek near Port Royal, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	642	47	835	160	270	670	218	385	124	615	31	11
2	205	47	835	160	205	1,020	205	588	112	218	40	12
3	136	192	560	180	192	1,720	160	465	104	104	91	16
4	112	92	405	150	205	1,280	150	1,420	104	76	110	12
5	97	65	445	140	242	890	138	6,460	91	66	70	80
6	85	57	350	136	300	725	134	2,760	90	56	50	160
7	79	53	270	132	255	615	128	1,490	85	54	53	230
8	76	52	230	150	230	488	124	1,020	91	60	57	205
9	69	52	205	160	315	445	160	725	86	57	52	91
10	65	54	205	128	445	535	170	560	80	60	45	64
11	62	49	192	92	488	385	138	445	78	54	34	67
12	62	44	170	85	465	350	128	510	79	53	30	80
13	56	42	170	85	350	405	122	1,280	79	73	30	57
14	57	39	1,210	100	315	315	120	1,020	67	54	28	44
15	57	39	1,790	100	270	425	128	725	62	52	27	32
16	52	69	835	85	230	385	150	535	58	54	30	30
17	50	1,720	560	70	230	332	510	425	58	43	26	37
18	52	1,020	425	55	205	315	285	368	108	44	28	42
19	52	465	300	55	170	270	218	315	88	53	27	49
20	52	332	270	70	300	255	180	270	67	34	25	34
21	52	255	170	180	320	242	160	242	58	52	18	30
22	49	205	255	535	260	218	160	218	54	76	14	150
23	49	615	535	780	218	192	535	230	52	43	16	118
24	45	1,080	368	510	205	192	1,020	180	54	37	13	73
25	50	560	270	285	140	230	510	180	53	30	13	57
26	49	385	205	192	160	192	368	192	47	30	13	52
27	52	285	270	205	170	170	285	160	52	27	12	54
28	65	270	218	180	242	160	255	150	52	25	11	42
29	84	218	140	180	------	150	255	255	84	30	10	42
30	57	180	230	192	------	140	445	180	104	34	12	37
31	45	------	180	285	------	138	------	140	------	37	12	------

NOTE—Discharge Jan. 12-20, Feb. 21 and 22 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Frankstown Branch Juniata River at Williamsburg.

Monthly discharge of Tuscarora Creek near Port Royal, for the year ending Sept. 30, 1921
(Drainage area 205 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	642	45	87.6	0.427	0.49
November	1,720	39	286	1.40	1.56
December	1,790	140	423	2.06	2.38
January	780	55	188	.917	1.06
February	488	140	264	1.29	1.34
March	1,720	138	447	2.18	2.51
April	1,020	120	252	1.23	1.37
May	6,460	140	771	3.76	4.34
June	124	47	77.4	.378	.42
July	615	25	74.2	.362	.42
August	110	10	33.2	.162	.19
September	230	11	66.9	.326	.36
The year	6,460	10	248	1.21	16.44

SUSQUEHANNA BASIN—STATION NO. 33

JUNIATA RIVER AT NEWPORT

Location.—At four-span steel highway bridge, Newport, Perry County.

Drainage Area.—3,380 square miles.

Records Available.—March 21, 1899, to July 14, 1906, and January 7, 1907, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by A. R. Bortel. Elevation of gage zero 363.32 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of hard material. Low-water control is at a riffle about 400 feet below gage.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 16.0 feet at midnight May 5-6 (discharge, 50,500 second-feet); minimum, 2.90 feet at 8 a. m. August 31 and September 4 (discharge, 540 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined below 10,000 second-feet and well defined from 10,000 to 70,000 second-feet. Gage read to tenths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for low stages when they are fair.

Discharge Measurements of Juniata River at Newport, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
72	Oct. 19	J. M. Snavely	3.36	1,190
73	Apr. 6	H. J. McIntyre	4.06	2,900

Daily Mean Gage Height, in feet, of Juniata River at Newport, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.25	3.28	5.45	4.2	4.95	5.15	4.25	5.8	4.15	4.05	3.52	3.08
2	6.15	4.22	5.7	4.15	4.85	5.85	4.25	5.85	4.0	4.28	3.35	3.02
3	4.95	3.92	5.5	4.2	4.75	7.3	4.3	5.75	3.95	4.58	3.62	3.05
4	4.4	3.85	5.5	4.15	4.55	9.15	4.15	6.25	3.9	4.4	3.9	2.95
5	4.2	3.9	5.4	4.1	4.5	9.1	4.1	13.2	3.8	4.05	4.28	3.12
6	3.95	3.65	5.2	4.1	4.7	7.85	4.05	14.9	3.8	3.8	3.98	3.3
7	3.8	3.52	5.05	4.0	4.9	7.05	4.0	11.4	3.65	3.78	3.98	3.6
8	3.85	3.22	4.75	4.0	4.9	6.85	4.0	9.2	3.75	3.58	4.1	4.25
9	3.75	3.52	4.55	4.0	4.85	6.55	3.9	7.45	3.75	3.55	4.48	3.88
10	3.7	3.25	4.4	4.15	5.05	6.6	4.0	6.5	3.7	3.45	4.02	3.55
11	3.55	3.3	4.4	4.1	5.35	6.35	4.0	5.95	3.7	3.48	3.82	3.65
12	3.55	3.35	4.3	4.05	5.45	5.9	4.0	5.7	3.6	3.75	3.7	3.6
13	3.55	3.2	4.1	4.15	5.3	5.8	4.0	6.8	3.6	3.9	3.6	3.65
14	3.5	3.45	5.5	4.0	5.2	5.65	4.0	7.4	3.55	3.82	3.55	3.55
15	3.5	3.3	7.7	3.9	5.1	5.7	3.95	7.05	3.6	3.9	3.5	3.22
16	3.5	3.4	7.05	3.9	5.0	5.85	4.0	6.3	3.65	3.75	3.28	3.15
17	3.45	5.4	6.3	4.15	4.9	5.75	4.35	5.8	3.6	3.65	3.42	3.2
18	3.35	7.0	5.6	3.6	4.8	5.6	4.3	5.45	3.6	3.62	3.45	3.22
19	3.35	5.75	5.25	3.75	4.7	5.5	4.2	5.2	3.7	3.45	3.4	3.15
20	3.4	5.45	4.9	4.15	4.6	5.25	4.1	4.95	3.75	3.52	3.45	3.25
21	3.4	5.05	4.7	3.95	4.4	5.1	4.1	4.75	3.55	3.55	3.45	3.28
22	3.35	5.5	4.5	4.5	4.4	5.0	3.95	4.45	3.45	3.82	3.45	3.4
23	3.35	5.85	4.75	5.95	4.5	4.8	4.35	4.5	3.55	3.5	3.2	4.65
24	3.25	7.5	4.9	7.0	4.4	4.65	5.6	4.4	3.5	3.35	3.28	4.2
25	3.18	7.05	4.85	6.35	4.3	4.7	5.55	4.3	3.6	3.35	3.35	3.8
26	3.25	6.35	4.65	5.7	4.35	4.65	5.1	4.2	3.45	3.25	3.3	3.75
27	3.57	5.75	4.7	5.1	4.25	4.5	4.85	4.25	3.4	3.35	3.35	3.4
28	4.45	5.35	4.6	4.9	4.35	4.4	4.65	4.2	3.6	3.35	3.25	3.65
29	3.75	5.0	4.5	4.6	-------	4.35	4.6	4.3	3.85	3.35	3.12	3.65
30	3.58	4.85	4.5	4.45	-------	4.2	5.15	4.45	3.7	3.35	3.08	3.5
31	3.48	-------	4.2	4.65	-------	4.1	-------	4.25	-------	3.6	2.95	-------

NOTE—Stage-discharge relation Jan. 16,17 and 19-21 affected by ice.

Daily discharge, in second-feet, of Juniata River at Newport, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,170	1,050	6,800	3,150	5,550	6,170	3,290	8,080	3,020	2,750	1.470	755
2	9,360	3,150	7,760	3,020	4,930	8,080	3,290	8,080	2,620	3,430	1,180	680
3	5,550	2,370	7,120	3,150	4,930	13.200	3,430	8,080	2,500	4.320	1,680	718
4	3,720	2,250	7,120	3,020	4,320	20,200	3,020	9,360	2,370	3,720	2,370	598
5	3,150	2,370	6,800	2,880	4,020	19,900	2,880	37.100	2,130	2,750	3,430	808
6	2,500	1,790	6,170	2,880	4,620	15,000	2,750	45,000	2,130	2,130	2,620	1,080
7	2,130	1,470	5,550	2,620	5,240	12,100	2,620	29,200	1,790	2.130	2,620	1,680
8	2,250	952	4,930	2,620	5,240	11,400	2,620	20,200	2,020	1,680	2,880	3,290
9	2,020	1,470	4,320	2,620	4.930	10,700	2,370	13,500	2,020	1.580	4,020	2,370
10	1,900	1,000	3,720	3,020	5,550	10,700	2,620	10,400	1,900	1.370	2,620	1,580
11	1,580	1,080	3,720	2,880	6,800	10,000	2,620	8,720	1,900	1,430	2.130	1,790
12	1,580	1,180	3,430	2,750	6,800	8,400	2,620	7,760	1,680	2.020	1,900	1,680
13	1,580	920	2.880	3,020	6,480	8,080	2,620	11,400	1,680	2,370	1,680	1,790
14	1,470	1,370	7,120	2,620	6,170	7,440	2,620	13,500	1,580	2.130	1,580	1.580
15	1,470	1,080	14,600	2,370	5,860	7,760	2,500	12,100	1.680	2.370	1.470	952
16	1,470	1.270	12,100	2.200	5.550	8,080	2.620	9,690	1,790	2,020	1.050	850
17	1.370	6.800	9.690	1.900	5.240	8,080	3,580	8.080	1.680	1,790	1,310	920
18	1,180	12,100	7,440	1,680	4.930	7,440	3,430	6,800	1,680	1,680	1,370	952
19	1,180	8,080	6.170	1.500	4,620	7,120	3,150	6,170	1,900	1,370	1,270	850
20	1,270	6,800	5,240	1,700	4.320	6,170	2,880	5,550	2,020	1,470	1.370	1,000
21	1.270	5.550	4.620	2.200	3.720	5.860	2,880	4.930	1,580	1.580	1,370	1.050
22	1,180	7,120	4.020	4,020	3,720	5,550	2,500	3,870	1.370	2,130	1,370	1,270
23	1.180	8.080	4,930	8.720	4.020	4,930	3.580	4.020	1,580	1,470	920	4.320
24	1,000	13,900	5.240	12.100	3,720	4.320	7,440	3,720	1,470	1.180	1,050	3,150
25	892	12,100	4.930	10,000	3,430	4.620	7.440	3.430	1.680	1,180	1,180	2.130
26	1.000	10,000	4.320	7,760	3.580	4.320	5.860	3,150	1,370	1.000	1,080	2.020
27	1,580	8.080	4.620	5.860	3.290	4.020	4,930	3,290	1,270	1,180	1,180	1,270
28	3.870	6.800	4.320	5.240	3,580	3.720	4.320	3,150	1,680	1,180	1,000	1,790
29	2.020	5.550	4.020	4.320	-------	3.580	4.320	3.430	2,250	1,180	808	1,790
30	1,680	4,930	4,020	3,870	-------	3,150	6,170	3,870	1,900	1,180	755	1,470
31	1,430	-------	3.150	4,320	-------	2.880	-------	3,290	-------	1,680	598	-------

NOTE—Discharge Jan. 16, 17 and 19-21 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Frankstown Branch Juniata River at Williamsburg.

Monthly discharge of Juniata River at Newport, for the year ending Sept. 30, 1921

(Drainage area 3,380 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	9,360	892	2,260	0.669	0.77
November	13,900	920	4,690	1.39	1.55
December	14,600	2,880	5,830	1.72	1.98
January	12,100	1,500	3,870	1.14	1.31
February	6,800	3,290	4,830	1.43	1.49
March	20,200	2,880	8,160	2.41	2.78
April	7,440	2,370	3,570	1.06	1.18
May	45,000	3,150	10,300	3.05	3.52
June	3,020	1,270	1,880	.556	.62
July	4,320	1,000	1,920	.568	.65
August	4,020	598	1,660	.491	.57
September	4,320	598	1,540	.456	.51
The year	45,000	598	4,220	1.25	16.93

SUSQUEHANNA BASIN—STATION NO. 34

SUSQUEHANNA RIVER AT HARRISBURG

Location.—At fifteen-span steel highway bridge, Walnut Street, Harrisburg, Dauphin County.

Drainage Area.—24,100 square miles.

Records Available.—January 1, 1891, to September 30, 1921.

Gages.—Standard chain attached to upstream side of bridge; read by employes of the Water Supply Commission of Pennsylvania. Elevation of gage zero 289.4 feet, United States Geological Survey datum. Sanborn water-stage recorder is located on top, downstream corner, of left abutment and referred to same datum as chain gage.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of gravel and boulders. A low dam 4,200 feet below the gage, completed on August 20, 1916, is the control for all except high stages.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 11.8 feet at 3 a. m. March 11 (discharge, 178,000 second-feet); minimum, 3.18 feet at 7.30 a. m. September 5 (discharge, 3,900 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 4,000 and 300,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height, computed from a continuous daily hydrograph, obtained by plotting chain gage readings in connection with water-stage recorder graph, to rating table. Results good.

Discharge Measurements of Susquehanna River at Harrisburg, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
110	Oct. 15 and 16	J. M. Snavely and H. J. McIntyre	3.88	11,800
111	Sept. 1*	J. M. Snavely	3.23	4,750

* Measurement made at upstream side of bridge.

Daily Mean Gage Height, in feet, of Susquehanna River at Harrisburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.89	3.88	6.00	4.70	4.97	5.12	5.54	5.82	4.93	3.60	3.50	3.23
2	6.42	3.92	6.60	4.72	4.82	5.90	5.60	6.29	4.76	3.72	3.52	3.23
3	6.92	4.02	7.50	4.69	4.62	7.13	5.80	6.47	4.58	3.84	3.72	3.22
4	6.46	4.29	8.31	4.74	4.48	8.54	5.90	6.67	4.44	3.81	3.89	3.21
5	5.87	4.52	8.09	4.82	4.46	9.44	5.82	8.73	4.42	3.76	3.95	3.18
6	5.36	4.38	7.55	4.96	4.49	8.90	5.56	9.54	4.28	3.60	3.88	3.23
7	4.92	4.26	6.92	4.95	4.74	7.86	5.34	8.70	4.11	3.54	3.83	3.28
8	4.63	4.18	6.64	4.82	4.79	8.15	5.17	7.91	3.98	3.47	3.86	3.34
9	4.47	4.11	6.46	4.82	4.78	10.44	5.03	7.10	3.93	3.50	4.06	3.54
10	4.34	4.04	6.16	4.80	4.84	11.23	4.96	6.43	3.87	3.49	4.39	3.49
11	4.22	3.98	5.68	4.76	4.92	11.44	4.89	5.92	3.80	3.46	4.51	3.48
12	4.09	3.90	5.45	4.82	4.92	10.15	4.84	5.66	3.77	3.52	4.18	3.46
13	4.04	3.86	5.26	4.59	4.94	8.82	4.80	5.88	3.70	3.62	3.96	3.48
14	3.96	3.84	5.48	4.70	4.81	8.06	4.72	5.97	3.66	3.68	3.84	3.64
15	3.90	3.82	7.80	4.69	4.74	8.08	4.66	5.88	3.64	3.66	3.88	3.69
16	3.84	3.82	8.77	4.43	4.79	7.79	4.60	5.50	3.64	3.67	3.83	3.54
17	3.80	4.45	8.44	4.35	4.82	7.38	4.64	5.18	3.61	3.62	3.74	3.46
18	3.75	5.53	7.69	4.47	5.32	7.12	4.65	5.00	3.58	3.69	3.70	3.44
19	3.70	5.66	6.88	5.22	6.93	6.85	4.84	4.84	3.54	3.64	3.73	3.40
20	3.67	5.75	6.26	5.18	6.50	6.53	4.78	4.67	3.53	3.66	3.72	3.42
21	3.66	5.55	5.79	5.50	5.90	6.26	4.78	4.59	3.52	4.08	3.70	3.85
22	3.65	5.37	5.45	5.70	5.57	6.02	4.80	4.46	3.50	4.00	3.68	3.80
23	3.64	5.50	5.40	6.13	5.22	5.84	5.04	4.39	3.47	3.92	3.60	4.01
24	3.60	6.39	5.46	5.45	5.02	5.82	6.14	4.33	3.43	3.77	3.49	5.13
25	3.56	7.48	5.47	5.54	4.94	5.86	7.74	4.31	3.40	3.69	3.51	4.70
26	3.55	7.98	5.42	5.41	4.79	5.92	7.68	4.38	3.40	3.68	3.50	4.34
27	3.52	7.38	5.46	5.00	4.67	5.92	6.85	4.29	3.37	3.61	3.46	4.10
28	3.62	6.74	5.15	4.50	4.62	5.76	6.29	4.27	3.38	3.58	3.41	3.99
29	3.70	6.30	4.89	4.38	-------	5.75	5.89	4.30	3.46	3.50	3.37	3.88
30	3.80	5.95	4.82	4.40	-------	5.66	5.74	4.47	3.58	3.48	3.32	3.78
31	3.80	-------	4.74	4.52	-------	5.63	-------	4.80	-------	3.46	3.29	-------

NOTE—Stage-discharge relation Jan. 18-27 affected by ice.

Daily discharge, in second-feet, of Susquehanna River at Harrisburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27,600	12,000	49,300	24,000	29,400	31,200	38,900	45,100	27,600	8,400	7,300	4,420
2	57,700	12,000	62,000	24,000	25,800	47,200	40,900	55,600	25,800	9,600	7,300	4,420
3	68,400	13,300	81,400	24,000	22,300	72,800	45,100	59,800	22,300	11,400	9,600	4,310
4	59,800	17,600	98,600	24,000	20,700	103,000	47,200	64,200	19,900	10,800	12,000	4,200
5	47,200	20,700	94,200	25,800	19,900	123,000	45,100	107,000	19,100	10,200	12,700	3,900
6	36,900	19,100	83,500	29,400	20,700	112,000	40,900	125,000	17,600	8,400	12,000	4,420
7	27,600	16,800	68,400	29,400	24,000	90,000	35,000	107,000	14,700	7,850	11,400	4,940
8	22,300	16,100	62,000	25,800	25,800	96,400	33,100	90,000	13,300	6,970	11,400	5,570
9	19,900	14,700	59,800	25,800	25,800	146,000	29,400	72,800	12,700	7,300	14,000	7,850
10	18,300	14,000	53.500	25,800	25,800	164,000	29,400	57,700	11,400	7,190	19,100	7,190
11	16,100	13,300	43,000	25,800	27,600	169,000	27,600	47,200	10,800	6,860	20,700	7,080
12	14,700	12,000	36,900	25,800	27,600	141,000	25,800	43,000	10,200	7,300	16,100	6,860
13	14,000	11,400	35,000	22,300	27,600	110,000	25,800	47,200	9,000	8,400	12,700	7,080
14	12,700	11,400	38,900	24,000	25,800	94,200	24,000	49,300	9,000	9,600	11,400	9,000
15	12,000	10,800	87,800	24,000	24,000	94,200	24,000	47,200	9,000	9,000	12,000	9,600
16	11,400	10,800	110,000	19,900	25,800	87,800	22,300	38,900	9,000	9,000	11,400	7,850
17	10,800	19,900	101,000	18,300	25,800	79,200	22,300	33,100	8,400	8,400	10,200	6,860
18	10,200	38,900	85,600	15,000	35,000	72,800	22,300	29,400	8,400	9,600	9,600	6,640
19	9,600	43,000	68,400	13,000	63,400	66,300	25.800	25,800	7,850	9,000	10,200	6,200
20	9,000	45,100	55,600	15,000	59,800	59.800	25,800	24,000	7,850	9,000	9,600	6,420
21	9,000	40,900	45,100	16,000	47,200	55,600	25,800	22,300	7,300	14,700	9,600	11,400
22	9,000	36,900	36,900	22,000	40,900	49,300	25,800	19,900	7,300	13,300	8,400	10,800
23	9,000	38,900	36,900	36,000	33,100	45,100	29,400	19,100	6,970	12,000	8,400	13,300
24	8,400	57,700	38,900	30,000	29,400	45,100	51,400	18,300	6,530	10,200	7,190	31,200
25	7,850	81,400	38,900	28,000	27,600	47,200	85,600	17,600	6,200	9,600	7,300	24,000
26	7,850	92,100	36,900	26,000	25,800	47,200	85,600	19,100	6,200	9,600	7,300	18,300
27	7,300	79,200	38,900	24,000	24,000	47,200	66,300	17,600	5,880	8,400	6,860	14,700
28	8,400	64,200	33.100	20,700	22,300	45,100	55,600	16,800	5,990	8,400	6.310	13,300
29	9,600	55,600	27,600	19,100	-------	45,100	47,200	17,600	6,860	7,300	5,880	12,000
30	10,800	49,300	25,800	19,100	-------	43,000	43,000	19,900	8,400	7,080	5,360	10,800
31	10,800	-------	24,000	20,700	-------	40,900	-------	25,800	-------	6,860	5,040	-------

NOTE—Discharge Jan. 18-27 estimated, because of ice, from weather records, study of gage height graph and comparison with discharge of Susquehanna River at Holtwood.

Monthly discharge of Susquehanna River at Harrisburg, for the year ending Sept. 30, 1921

(Drainage area 24,100 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	68,400	7,300	19,500	0.810	0.93
November	92,100	10,800	32,300	1.34	1.50
December	110,000	24,000	56,700	2.35	2.71
January	36,000	13,000	23,300	.967	1.11
February	68,400	19,900	29,900	1.24	1.29
March	169,000	31,200	79,700	3.31	3.82
April	85,600	22,300	38,200	1.59	1.77
May	125,000	16,800	44,600	1.85	2.13
June	27,600	5,880	11,400	.473	.53
July	14,700	6,860	9,090	.377	.43
August	20,700	5,040	10,300	.42	.49
September	31,200	3,900	9,490	.394	.44
The year	169,000	3,900	30,500	1.27	17.15

SUSQUEHANNA BASIN—STATION NO. 35

LITTLE SWATARA CREEK NEAR PINE GROVE

Location.—At single-span steel highway bridge, about three-quarters of a mile upstream from mouth of creek and one mile southeast of Pine Grove, Schuylkill County.

Drainage Area.—34 square miles.

Records Available.—November 18, 1919, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Miss Lottie Mars.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Both banks are of medium height; overflow begins at a stage of about 6 feet. Bed is composed of coarse gravel. Control is at a riffle, at the upstream end of an island, about 100 feet below gage. Bed at control is coarse gravel; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 5.7 feet at 4 a. m. May 5 (discharge, about 945 second-feet); minimum, 1.02 feet several times in August and September (discharge, 3.0 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined below 500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Cooperation.—Station is maintained in cooperation with J. G. White Management Corporation, New York City.

Discharge Measurements of Little Swatara Creek near Pine Grove, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
13	May 11*	H. J. McIntyre,	2.00	78.3
14	July 6†	H. L. Landis	1.16	5.43
15	6‡	H. L. Landis	1.16	5.04
16	Aug. 8‖	H. L. Landis	1.78	45.3

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* Measurement made by wading 25 feet above gage.
† Measurement made by wading 100 feet above gage.
‡ Measurement made by wading 250 feet above gage.
‖ Measurement made by wading 30 feet above gage.

Daily Mean Gage Height, in feet, of Little Swatara Creek near Pine Grove, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.64	1.40	2.80	------	1.95	2.86	2.14	2.46	1.46	1.31	1.20	1.06
2	2.22	1.50	2.62	1.90	1.82	2.92	1.94	2.56	1.51	1.26	1.34	1.13
3	2.00	1.74	2.36	1.86	1.70	3.82	1.86	2.41	1.45	1.25	1.66	1.16
4	1.90	1.50	2.22	1.82	1.69	3.42	1.84	3.39	1.56	1.25	1.58	1.09
5	1.82	1.42	2.41	1.78	1.69	2.75	1.82	5.05	1.45	1.26	1.32	1.04
6	1.74	1.42	2.17	1.75	2.08	2.51	1.75	3.28	1.40	1.21	1.28	1.09
7	1.70	1.45	2.10	1.72	1.82	2.40	1.74	2.68	1.38	1.26	1.36	1.18
8	1.66	1.46	2.04	1.75	1.76	2.29	1.74	2.44	1.38	1.22	1.61	1.08
9	1.58	1.42	1.96	1.71	1.79	2.52	1.81	2.25	1.36	1.20	1.60	1.04
10	1.58	1.43	1.94	1.68	1.85	2.53	1.75	2.14	1.34	1.28	1.54	1.04
11	1.54	1.34	1.90	1.68	2.16	2.42	1.73	2.04	1.34	1.47	1.42	1.04
12	1.50	1.34	1.83	1.63	1.98	2.32	1.66	2.28	1.36	1.47	1.38	1.18
13	1.48	1.33	1.80	1.62	1.90	2.37	1.64	2.59	1.32	1.34	1.38	1.14
14	1.48	1.40	3.40	2.32	1.88	2.16	1.61	2.17	1.32	1.30	1.32	1.08
15	1.50	1.35	3.05	2.22	1.82	2.19	1.85	2.07	1.30	1.28	1.28	1.06
16	1.51	1.52	2.56	1.99	1.80	2.18	1.90	1.98	1.29	1.26	1.26	1.04
17	1.46	2.68	2.30	2.00	1.82	2.09	1.83	1.94	1.28	1.22	1.29	1.12
18	1.54	2.28	2.10	2.33	1.80	2.00	1.82	1.88	1.33	1.22	1.26	1.30
19	1.51	2.08	2.03	2.78	1.75	1.94	1.74	1.84	1.29	1.39	1.26	1.07
20	1.46	1.96	1.96	2.60	1.94	1.92	1.73	1.76	1.19	2.02	1.21	1.06
21	1.40	1.87	1.91	2.62	2.44	1.88	1.71	1.71	1.20	1.60	1.28	1.20
22	1.49	1.86	1.86	2.43	2.20	1.82	1.66	1.68	1.22	1.46	1.22	1.40
23	1.40	2.44	2.46	2.01	2.04	1.78	2.34	1.67	1.22	1.38	1.22	1.28
24	1.41	2.28	2.26	1.86	1.98	2.08	2.51	1.63	1.24	1.36	1.20	1.20
25	1.42	2.19	2.14	2.06	1.76	2.67	2.23	1.64	1.20	1.32	1.17	1.18
26	1.41	2.06	2.02	2.28	1.68	2.40	2.10	1.63	1.19	1.28	1.19	1.30
27	1.44	1.98	2.06	2.29	1.84	2.22	2.00	1.58	1.18	1.27	1.18	1.19
28	1.72	1.94	2.02	2.32	2.44	2.12	1.88	1.56	1.26	1.26	1.10	1.16
29	1.50	1.87	1.94	2.33	-------	2.02	1.91	1.68	1.57	1.32	1.14	1.20
30	1.50	1.90	1.88	1.92	-------	1.96	2.13	1.56	1.43	1.25	1.10	1.14
31	1.41	-------	1.86	2.42	-------	2.01	-------	1.49	-------	1.13	1.06	-------

NOTE—Gage height Jan. 1 not observed. Stage-discharge relation Jan. 17-21 and 25-30 affected by ice.

Daily discharge, in second-feet, of Little Swatara Creek near Pine Grove, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	216	13	251	59	70	262	104	174	17	9.3	6.0	3.5
2	121	19	205	62	51	274	68	194	20	7.7	10	4.6
3	78	41	152	56	36	489	56	163	16	7.4	32	5.2
4	62	19	121	51	35	393	54	393	24	7.4	25	3.9
5	51	14	163	46	35	240	51	777	16	7.7	9.7	3.2
6	41	14	111	42	92	183	42	369	13	6.3	8.3	3.9
7	36	16	96	38	51	161	41	228	12	7.7	11	5.6
8	32	17	85	42	43	137	41	170	12	6.6	49	3.8
9	25	14	72	37	47	183	49	128	11	6.0	27	3.2
10	25	15	68	34	55	194	42	104	10	8.3	22	3.2
11	22	10	62	34	109	165	40	85	10	17	14	3.2
12	19	10	52	30	75	143	32	135	11	17	12	5.6
13	18	10	48	29	62	154	31	205	9.7	10	12	4.8
14	18	13	393	143	59	109	28	111	9.7	9.0	9.7	3.8
15	19	11	297	121	51	115	55	91	9.0	8.3	8.3	3.5
16	20	21	194	76	48	113	62	75	8.6	7.7	7.7	3.2
17	17	228	139	50	51	94	52	68	8.3	6.6	8.6	4.4
18	22	135	96	42	48	78	51	59	10	6.6	7.7	9.0
19	20	92	83	46	42	68	41	54	8.6	13	7.7	3.6
20	17	72	72	60	68	65	40	43	5.8	82	6.3	3.5
21	13	58	64	180	170	59	37	37	6.0	27	8.3	6.0
22	18	56	56	168	117	51	32	34	6.6	17	6.6	18
23	13	170	174	80	85	46	148	33	6.6	12	6.6	8.3
24	14	135	130	56	75	92	183	30	7.1	11	6.0	6.0
25	14	115	104	42	43	216	124	31	6.0	9.7	5.4	5.6
26	14	89	82	38	34	161	96	30	5.8	8.3	5.8	9.0
27	15	75	89	36	54	121	78	25	5.6	8.0	5.6	5.8
28	38	68	82	36	170	100	59	24	7.7	7.7	4.1	5.2
29	19	58	68	36	-------	82	64	34	25	9.7	4.8	6.0
30	19	62	59	42	-------	72	102	24	15	7.4	4.1	4.8
31	14	-------	56	165	-------	80	-------	18	-------	4.6	3.5	-------

NOTE—Discharge Jan. 1 interpolated, because of no gage height record. Discharge Jan. 17-21 and 25-30 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Swatara Creek at Harpers.

Monthly discharge of Little Swatara Creek near Pine Grove, for the year ending Sept. 30, 1921

(Drainage area 34 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	216	13	34.5	1.01	1.16
November	228	10	55.7	1.64	1.83
December	393	48	120	3.53	4.07
January	168	29	63.8	1.88	2.17
February	170	34	67.0	1.97	2.05
March	489	46	152	4.47	5.15
April	183	28	63.4	1.86	2.08
May	777	18	127	3.74	4.31
June	25	5.6	11.1	.326	.36
July	82	4.6	12.1	.356	.41
August	49	3.5	11.4	.335	.39
September	18	3.2	5.31	.156	.17
The year	777	3.2	60.5	1.78	24.15

SUSQUEHANNA BASIN—STATION NO. 36

SWATARA CREEK AT HARPERS

Location.—At two-span steel highway bridge, Harpers, Lebanon County, about five miles northwest of Annville.

Drainage Area.—334 square miles.

Records Available.—December 17, 1918, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Elmer G. Shuey.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—At low and medium stages, the stream flows under the left span of the bridge. There is a flood plain under the right span which is covered by water during high stages. Outside of the flood plain both banks are high and do not overflow. Bed is composed of culm and gravel. Control is at a riffle about 300 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 10.16 feet observed at 12.30 p. m. May 5 (discharge, 7,640 second-feet); minimum, 0.18 foot at 6.15 p. m. September 3 (discharge, 19 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined below 500 second-feet and fairly well defined between 500 and 6,000 second-feet. Gage read to hundredths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Swatara Creek at Harpers, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
14	May 11	H. J. McIntyre	2.71	916
15	July 6*	H. L. Landis	.33	72.6
16	Aug. 8†	H. L. Landis	1.09	236

* Measurement made by wading 150 feet above gage.
† Measurement made by wading 50 feet below gage.

Daily Mean Gage Height, in feet, of Swatara Creek at Harpers, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.79	0.56	3.93	1.89	2.02	5.28	2.50	3.75	1.02	0.90	0.30	0.22
2	3.00	.58	4.19	1.94	1.54	4.68	2.27	3.90	.93	.65	.46	.23
3	2.42	1.72	3.34	2.07	1.51	5.70	2.01	3.48	.87	.53	1.09	.20
4	1.98	1.19	2.98	1.77	1.48	5.29	1.86	4.58	1.04	.44	1.20	.22
5	1.76	.88	3.65	1.65	1.46	4.40	1.76	9.24	.95	.44	.70	.24
6	1.54	.71	3.06	1.60	2.11	3.93	1.66	6.18	.82	.44	.50	.29
7	1.33	.66	2.78	1.49	1.95	3.59	1.61	4.83	.76	.40	.43	.34
8	1.24	.70	2.51	1.54	1.66	3.24	1.54	3.95	.74	.40	1.06	.30
9	1.12	.70	2.34	1.58	1.84	3.13	1.65	3.48	.74	.49	.76	.22
10	1.04	.66	2.14	1.40	2.11	4.01	1.64	3.01	.70	.60	.54	.22
11	.98	.62	2.08	1.36	2.49	3.28	1.49	2.70	.68	.54	.44	.24
12	.90	.56	1.74	1.31	2.42	3.06	1.36	2.55	.68	1.22	.43	.29
13	.89	.52	1.84	1.08	2.12	3.19	1.28	3.93	.63	.98	.39	.32
14	.88	.52	5.54	1.13	1.97	2.78	1.24	3.01	.56	.67	.38	.30
15	.72	.54	6.49	2.25	1.90	2.84	1.72	2.46	.52	.58	.36	.26
16	.70	.82	4.44	2.25	1.79	2.88	2.61	2.29	.54	.46	.36	.24
17	.70	3.88	3.69	1.71	1.82	2.56	2.22	2.09	.51	.40	.37	.26
18	.68	3.35	3.12	1.30	1.72	2.38	1.96	2.00	.52	.39	.37	.35
19	.70	2.45	2.64	2.16	1.37	2.28	1.82	1.85	.50	.44	.34	.33
20	.68	2.14	2.40	2.40	1.10	2.11	1.67	1.72	.48	2.14	.31	.30
21	.66	1.90	2.15	2.18	1.30	2.02	1.56	1.64	.48	.97	.30	.37
22	.60	1.74	2.21	3.02	1.72	1.88	1.46	1.52	.42	.60	.29	1.34
23	.59	2.50	4.44	2.84	1.68	1.74	3.01	1.58	.43	.50	.30	.73
24	.57	2.57	3.41	2.26	1.76	1.83	4.52	1.40	.40	.40	.28	.45
25	.57	2.34	2.88	1.40	1.44	3.88	3.42	1.39	.36	.40	.28	.38
26	.60	2.20	2.66	1.52	1.36	3.50	2.94	1.42	.32	.38	.26	.44
27	.57	2.01	2.47	1.65	1.61	2.97	2.60	1.26	.32	.32	.24	.36
28	1.10	1.92	2.57	1.52	3.85	2.71	2.38	1.16	.38	.30	.26	.36
29	.98	1.78	2.22	1.52	------	2.60	2.43	1.62	1.17	.35	.24	.32
30	.64	1.71	2.12	1.56	------	2.30	3.06	1.36	1.26	.35	.24	.32
31	.57	------	2.04	2.76	------	2.21	------	1.14	------	.33	.23	------

NOTE—Stage-discharge relation Jan. 19-21 and 26-30 affected by ice.

Daily discharge, in second-feet, of Swatara Creek at Harpers, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,290	105	1,640	520	560	2,690	795	1,570	215	190	45	27
2	1,050	110	1,850	540	382	2,210	695	1,640	198	128	82	30
3	745	440	1,230	605	365	3,030	560	1,360	182	98	240	23
4	560	279	1,050	460	365	2,690	500	2,130	228	77	300	27
5	460	185	1,430	420	348	1,990	460	6,470	202	77	140	32
6	382	142	1,110	400	605	1,640	420	3,480	170	77	91	43
7	315	130	945	365	540	1,430	400	2,290	155	68	75	51
8	285	140	795	382	420	1,170	382	1,710	150	68	228	45
9	240	140	695	400	500	1,110	420	1,360	150	89	155	27
10	228	130	605	330	605	1,710	420	1,050	140	115	101	27
11	210	120	605	315	795	1,230	365	895	135	101	77	32
12	190	105	460	300	745	1,110	315	845	135	270	75	43
13	188	96	500	240	605	1,170	300	1,640	122	210	66	50
14	185	96	2,850	255	540	945	285	1,050	105	132	63	45
15	145	101	3,750	650	520	945	440	795	96	110	59	36
16	140	170	1,990	650	480	995	845	695	101	82	59	32
17	140	1,640	1,500	440	480	845	650	605	93	68	61	36
18	135	1,290	1,110	300	440	745	540	560	96	66	61	56
19	140	745	845	260	315	695	480	500	91	77	54	52
20	135	605	745	340	240	605	420	440	86	605	47	45
21	130	520	650	440	300	560	382	420	86	208	45	61
22	115	460	650	1,050	440	520	348	365	73	115	43	315
23	113	795	1,990	945	440	460	1,050	400	75	91	45	148
24	108	845	1,290	695	460	500	2,060	330	68	68	41	80
25	108	695	995	330	348	1,640	1,290	330	59	68	41	63
26	115	650	895	260	315	1,360	995	330	50	63	36	77
27	108	560	795	240	400	1,050	845	285	50	50	32	59
28	240	520	845	260	1,570	895	745	255	63	45	36	59
29	210	480	650	260	-------	845	745	400	255	56	32	50
30	125	440	605	300	-------	695	1,110	315	285	56	32	50
31	108	-------	560	945	-------	650	-------	255	-------	52	30	-------

NOTE—Discharge Jan. 19-21 and 26-30 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Little Swatara Creek near Pine Grove.

Monthly discharge of Swatara Creek at Harpers, for the year ending Sept. 30, 1921

(Drainage area 334 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	2,290	108	311	0.931	1.07
November	1,640	96	424	1.27	1.42
December	3,750	460	1,150	3.44	3.97
January	1,050	240	448	1.34	1.54
February	1,570	240	504	1.51	1.57
March	3,030	460	1,230	3.68	4.24
April	2,060	285	642	1.92	2.14
May	6,470	255	1,120	3.35	3.86
June	285	50	130	.389	.43
July	605	45	115	.344	.40
August	300	30	80.4	.241	.28
September	315	23	57.5	.172	.19
The year	6,470	23	520	1.56	21.11

SUSQUEHANNA BASIN—STATION NO. 37

CODORUS CREEK AT YORK

Location.—At three-span steel highway bridge, South Penn Street, York, York County.

Drainage Area.—221 square miles.

Records Available.—October 7, 1915, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to hundredths twice daily by Thomas F. Heberly. Elevation of zero gage 351.79 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of mud and gravel. The Loucks Mill Dam, located about one and one-half miles below gage, is control for medium, high and probably low stages when the water surface at dam is not below the crest elevation. During low stages, when the water surface is below the crest of the dam, the station control is probably at a riffle about 800 feet below the gage. Stage-discharge relation variable during low stages on account of operations at Loucks Mill.

Extremes of Stage.—Maximum gage height during the year estimated from hydrograph, 6.0 feet at 6 p. m. May 13; minimum, 0.70 foot at 8 a. m. August 27.

Ice.—Stage-discharge relation rarely affected by ice.

Discharge Measurements of Codorus Creek at York, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
22	Nov. 24	H. J. McIntyre	1.51	120
23	Mar. 14	H. J. McIntyre	2.10	286
24	Apr. 1	H. J. McIntyre	2.11	285
25	May 5	H. J. McIntyre	4.45	1,210
26	June 23	J. M. Snavely	1.28	68.2
27	Aug. 22	H. J. McIntyre	1.23	47.7

Daily Mean Gage Height, in feet, of Codorus Creek at York, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.90	0.95	3.27	1.42	1.76	3.63	1.82	1.97	1.76	1.65	1.00	0.94
2	1.68	1.00	3.15	1.52	1.71	3.67	1.75	2.02	1.66	1.60	1.29	.96
3	1.50	1.70	1.55	1.60	1.74	4.41	1.71	2.12	1.64	1.51	2.35	.91
4	1.32	1.55	1.35	1.55	1.69	3.65	1.72	3.41	1.60	1.54	1.72	.91
5	1.20	1.40	2.13	1.52	1.67	2.79	1.78	4.49	1.57	1.52	1.28	.94
6	1.25	1.35	1.95	1.50	1.70	2.59	1.74	3.28	1.53	1.46	1.18	1.02
7	1.22	1.30	1.68	1.52	1.66	2.47	1.71	2.65	1.50	1.42	1.08	1.67
8	1.20	1.20	1.60	1.55	1.67	2.42	1.71	2.42	1.48	1.39	2.01	.99
9	1.20	1.10	1.50	1.58	1.70	2.62	1.78	2.32	1.58	1.40	1.35	.92
10	1.20	1.00	1.38	1.60	1.78	2.67	1.77	2.15	1.55	1.41	1.08	.92
11	1.18	1.00	1.32	1.58	1.71	2.32	1.74	2.00	1.49	1.58	1.01	.94
12	1.12	.95	1.30	1.60	1.67	2.17	1.70	2.34	1.62	1.39	1.01	1.05
13	1.05	.95	1.30	1.56	1.65	2.12	1.66	5.10	1.56	1.22	.98	1.02
14	1.00	1.00	2.21	1.95	1.62	2.08	1.62	4.66	1.52	1.12	1.02	.98
15	.95	1.05	2.25	2.48	1.60	2.03	1.59	3.35	1.50	1.02	1.02	.96
16	.90	1.70	1.88	2.30	1.60	2.11	1.55	2.90	1.48	1.02	1.02	.96
17	.95	-------	1.75	1.85	1.63	2.09	1.56	2.32	1.46	1.00	1.00	1.00
18	1.00	-------	1.68	1.60	1.62	2.14	1.57	2.08	1.52	.99	1.82	.98
19	1.10	-------	1.58	1.52	1.62	2.06	1.61	2.02	1.47	3.47	1.58	1.02
20	1.10	-------	1.50	1.58	1.63	2.02	1.65	2.04	1.48	2.34	1.15	.96
21	1.00	-------	1.48	1.64	1.66	1.95	1.66	2.03	1.45	1.50	1.06	1.00
22	.95	-------	1.42	1.68	1.68	1.90	1.68	2.04	1.35	1.02	.99	2.12
23	.90	-------	2.42	1.90	1.70	2.05	1.71	2.00	1.18	1.02	.93	1.40
24	.95	1.52	2.35	1.68	1.69	2.32	1.66	2.01	1.18	1.00	.86	1.22
25	.95	-------	2.10	1.50	1.67	2.18	1.64	1.97	1.35	.98	.79	1.18
26	1.05	1.46	1.85	1.58	1.69	2.00	1.69	1.93	1.42	.95	.75	1.52
27	1.20	1.42	1.70	1.75	1.69	1.95	1.66	1.89	1.40	.91	.72	1.20
28	1.10	1.40	1.65	1.72	2.67	1.90	1.72	1.86	1.45	.86	.84	1.09
29	1.00	1.35	1.52	1.66	-------	1.84	1.85	2.02	1.42	.87	.98	1.02
30	.90	1.70	1.42	1.68	-------	1.78	1.95	1.94	1.66	1.90	.97	1.08
31	.95	-------	1.49	1.80	-------	1.70	-------	1.83	-------	1.22	.96	-------

NOTE—Gage height Nov. 17-23 and 25 not observed.

OHIO BASIN

OHIO BASIN—STATION NO. 1

ALLEGHENY RIVER NEAR LARABEE

Location.—At single-span steel highway bridge on road to Corryville, about one mile south of Pennsylvania Railroad station at Larabee, McKean County.

Drainage Area.—545 square miles.

Records Available.—June 29, 1915, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Mrs. A. L. Dawley.

Discharge Measurements.—Made from upstream side of bridge or by wading; during extremely high stages from railroad bridge about 200 feet below gage.

Channel and Control.—The right bank is high and not subject to overflow. The river begins to overflow the left bank, above the bridge, into a broad flat at a gage height of about 4 feet, and is again discharged into the river as the stream recedes. Bed is composed of gravel, stones and boulders. Low-water control is the upper sill of an old timber dam about 60 feet below the gage. The timber abutments are vertical and have the effect of a weir at low stages.

Extremes of Discharge.—Maximum stage during the year, 11.25 feet observed at 8.30 a. m. and 5 p. m. March 10 (discharge, about 3,400 second-feet); minimum, 0.56 foot at 8 a. m. September 2 (discharge, 110 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 150 and 2,000 second-feet. Gage read to half tenths from October to March and hundredths from April to September. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for extreme stages when they are fair.

Cooperation.—Station is maintained in cooperation with the United States Engineer Office, Pittsburgh.

Discharge Measurements of Allegheny River near Larabee, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
12	Mar. 23	J. M. Snavely	6.49	1,570
13	30	J. M. Snavely	4.94	1,050
14	30	J. M. Snavely	4.89	1,050
15	May 5	J. M. Snavely	4.49	921
16	6	J. M. Snavely	4.46	928
17	Sept. 12	J. M. Snavely	2.74	440

Daily Mean Gage Height, in feet, of Allegheny River near Larabee, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.05	0.9	4.0	4.2	3.25	3.6	6.66	5.48	4.44	2.47	1.09	0.61
2	2.8	.85	5.0	5.2	3.07	3.75	6.30	5.24	3.59	1.88	1.07	.61
3	2.08	1.6	5.5	5.8	2.95	5.8	5.56	4.94	3.25	1.50	2.09	.66
4	1.68	1.62	5.32	4.15	2.8	5.87	5.21	4.72	3.28	1.30	1.63	.70
5	1.45	1.28	5.45	3.65	3.05	5.6	4.82	4.50	2.64	1.18	1.17	.88
6	1.32	1.18	5.6	3.85	4.23	7.45	4.52	4.46	2.28	1.10	1.09	1.99
7	1.18	1.12	5.1	3.5	3.7	9.4	4.12	3.96	2.08	1.03	3.19	1.71
8	1.12	1.05	4.52	3.45	3.45	10.55	3.87	3.78	1.98	1.07	4.35	.98
9	1.02	1.15	3.92	4.3	3.37	10.9	6.30	3.46	1.77	1.40	2.87	.80
10	.95	1.48	3.72	4.05	3.73	11.2	6.23	3.16	1.64	1.19	2.02	.92
11	9	1.58	3.58	4.2	3.8	10.35	5.74	2.90	1.61	1.38	1.81	3.49
12	.92	1.42	3.28	3.95	3.47	9.65	5.34	2.70	2.66	1.26	2.25	2.75
13	1.02	1.25	3.15	4.0	3.4	8.85	4.94	2.95	2.05	1.29	1.81	1.81
14	.9	1.3	4.5	4.05	3.25	7.95	4.56	2.80	1.65	1.66	1.72	1.37
15	.82	1.42	7.1	4.25	3.37	7.05	4.52	2.45	1.38	1.96	1.42	1.16
16	.8	1.5	6.6	4.35	4.45	6.9	4.22	2.20	1.22	2.08	1.25	1.08
17	.8	1.75	5.25	3.7	9.35	7.15	4.34	2.04	1.34	1.67	1.15	1.94
18	.8	2.15	4.85	3.2	8.65	6.85	4.00	1.92	1.38	1.47	1.75	9.02
19	.8	1.78	4.65	3.05	6.65	6.3	3.74	1.83	1.20	-------	1.58	7.50
20	.8	1.8	4.45	3.25	5.55	6.8	3.44	1.70	1.04	2.65	1.05	4.92
21	.78	3.05	4.72	3.85	5.05	7.0	3.32	1.54	.99	1.92	1.11	4.06
22	.75	5.95	-------	4.15	4.5	6.95	3.26	1.42	.98	1.62	.99	7.25
23	.75	8.0	5.72	5.0	3.97	6.58	4.53	4.22	1.12	1.45	.89	6.08
24	.75	8.55	5.08	4.4	3.6	6.25	6.45	4.50	1.02	1.31	.87	4.78
25	.7	8.1	-------	3.3	3.35	6.3	5.78	3.60	.94	1.31	.83	4.30
26	.7	7.08	4.75	3.25	3.15	5.85	5.46	3.08	.90	1.45	.77	5.15
27	.82	6.0	6.08	3.5	3.4	5.2	5.46	2.72	.90	1.05	.71	3.91
28	1.2	5.25	5.55	3.45	3.5	5.15	5.09	2.60	.92	1.02	-------	3.36
29	1.02	4.72	5.3	3.45	-------	5.45	5.31	5.68	2.33	1.85	.66	3.14
30	1.0	4.1	5.3	3.47	-------	4.95	5.74	4.90	3.31	2.09	.66	2.86
31	.98	-------	4.22	3.7	-------	5.25	-------	4.25	-------	1.62	.65	-------

NOTE—Gage height Dec. 22, 25, July 19 and Aug. 28 not observed. Stage-discharge relation Dec. 27-30 affected by ice.

Daily discharge, in second-feet, of Allegheny River near Larabee, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	780	145	780	840	550	660	1,680	1,260	900	392	165	115
2	456	135	1,080	1,150	525	720	1,540	1,150	660	279	165	115
3	314	230	1,260	1,369	500	1,360	1,290	1,050	550	215	314	120
4	246	230	1,180	810	456	1,400	1,150	990	575	188	230	125
5	201	188	1,220	660	500	1,290	1,020	930	413	176	176	145
6	188	176	1,290	720	840	1,920	930	930	352	165	165	296
7	176	165	1,120	630	690	2,660	810	780	314	155	550	246
8	165	155	930	600	600	3,140	750	720	296	165	900	155
9	155	176	750	870	600	3,260	1,540	630	262	201	478	135
10	155	215	690	780	690	3,380	1,500	550	230	176	296	145
11	145	230	660	840	720	3,060	1,320	478	230	201	262	630
12	145	201	575	780	630	2,740	1,180	434	434	188	333	456
13	155	176	550	780	600	2,420	1,050	500	296	188	262	262
14	145	188	930	780	550	2,130	960	456	230	246	246	201
15	135	201	1,820	840	600	1,780	930	372	201	296	201	176
16	135	215	1,640	900	900	1,740	840	333	176	314	176	165
17	135	262	1,150	690	2,660	1,850	870	296	188	246	176	279
18	135	333	1,020	550	2,340	1,710	780	279	201	215	262	2,500
19	135	262	960	500	1,640	1,540	690	262	176	450	230	1,960
20	135	262	900	550	1,290	1,710	600	246	155	413	155	1,050
21	135	500	990	720	1,080	1,780	575	215	155	279	165	810
22	135	1,430	1,350	840	930	1,780	575	201	155	230	155	1,850
23	135	2,130	1,320	1,080	780	1,640	930	840	165	201	145	1,460
24	135	2,340	1,120	900	660	1,500	1,570	930	155	188	145	1,020
25	125	2,160	1,050	575	600	1,540	1,360	660	145	188	135	870
26	125	1,820	1,020	550	550	1,360	1,260	525	145	201	135	1,150
27	135	1,430	950	630	600	1,150	1,260	434	145	155	125	750
28	176	1,150	900	600	630	1,150	1,120	413	145	155	120	600
29	155	990	850	600	-------	1,220	1,180	1,320	352	262	120	525
30	155	810	850	630	-------	1,080	1,320	1,050	575	314	120	478
31	155	-------	840	690	-------	1,150	-------	840	-------	230	120	-------

NOTE—Discharge Dec. 22, 25, July 19 and Aug. 28 estimated, because of no gage height record, from discharge of Allegheny River at Red House and Sinnemahoning Creek at Sterling Run. Discharge Dec. 27-30 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Allegheny River at Red House and Sinnemahoning Creek at Sterling Run.

Monthly discharge of Allegheny River near Larabee, for the year ending Sept. 30, 1921

(Drainage area 545 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	780	125	187	0.343	0.40
November	2,340	135	630	1.16	1.29
December	1,820	550	1,020	1.87	2.16
January	1,360	500	757	1.39	1.60
February	2,660	456	847	1.55	1.61
March	3,380	660	1,800	3.30	3.80
April	1,680	575	1,090	2.00	2.23
May	1,320	201	648	1.19	1.37
June	900	145	299	.549	.61
July	392	155	235	.431	.50
August	900	120	233	.428	.49
September	2,500	115	626	1.15	1.28
The year	3,380	115	697	1.28	17.34

OHIO BASIN—STATION NO. 2

BROKENSTRAW CREEK AT YOUNGSVILLE

Location.—At single-span steel highway bridge, Youngsville, Warren County.

Drainage Area.—290 square miles.

Records Available.—October 22, 1909, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by William L. York. Elevation of gage zero 1,188.92 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of silt, clay and gravel. Control is at the first of a series of riffles extending from 300 to 500 feet below gage; may shift occasionally.

Extremes of Discharge.—Maximum stage during the year, 5.55 feet observed at 8.30 a. m. March 7 (discharge, 4,080 second-feet); minimum, —0.38 foot at 5.35 p. m. August 30 (discharge, 32 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 50 and 5,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Brokenstraw Creek at Youngsville, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
38	Apr. 19	J. M. Snavely	2.63	1,370
39	July 27*	J. M. Snavely	-.16	52.3

* Measurement made by wading 500 feet above gage.

Daily Mean Gage Height, in feet, of Brokenstraw Creek at Youngsville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.55	0.55	1.00	1.06	0.82	1.26	2.98	3.86	0.66	1.07	-0.22	-0.32
2	.78	.56	2.02	3.23	.79	1.66	2.65	2.32	.42	.46	-.15	-.30
3	1.06	1.46	2.50	3.62	.82	3.32	1.90	1.77	.42	.26	-.05	-.12
4	.76	1.60	1.80	2.75	.63	3.10	1.50	1.60	.35	.14	-.10	-.14
5	.30	1.00	1.68	1.88	.82	2.19	1.28	1.62	.24	.10	-.20	-.20
6	.17	.64	2.60	1.72	1.55	3.86	1.14	1.48	.19	.10	-.10	-.03
7	.14	.49	2.30	1.65	1.52	5.25	1.04	1.02	.19	.06	1.25	-.19
8	.10	.40	1.66	2.10	1.29	4.58	.97	.86	.14	.02	.98	-.28
9	.06	.43	1.18	2.08	1.51	3.58	1.25	.76	.12	.22	.43	-.30
10	.04	1.02	1.03	1.38	1.68	3.25	1.26	.70	.10	.09	.18	-.22
11	.00	.96	.92	1.26	1.58	2.48	1.08	.56	.24	.00	-.02	.40
12	.05	.71	.90	1.01	1.28	1.74	.97	.59	.89	.00	.00	.00
13	.10	.56	.92	.85	1.15	2.62	.88	.60	.38	.21	-.06	-.16
14	.09	.52	2.23	.92	1.10	2.42	.82	.70	.20	.10	-.10	-.22
15	.00	.47	2.96	.84	1.08	1.75	1.32	.62	.10	-.04	-.15	-.25
16	-.02	.48	2.31	.72	2.00	1.78	1.28	.74	.05	-.10	-.18	-.30
17	-.08	.72	1.45	.50	4.42	1.69	1.55	.47	.08	-.12	-.07	-.01
18	-.09	1.25	1.18	.50	3.86	1.68	2.70	.42	.10	-.14	-.05	1.12
19	-.04	1.39	1.14	1.09	2.96	1.55	2.39	.38	.02	-.10	.42	.80
20	-.09	1.42	1.05	1.25	1.82	1.76	1.59	.36	-.06	.04	.12	.40
21	-.08	1.92	.90	1.15	1.25	2.25	1.45	.30	-.10	-.08	-.06	.68
22	-.10	3.25	1.05	2.58	1.20	2.28	1.08	.31	-.09	-.14	-.13	1.98
23	-.09	4.60	2.18	3.30	1.10	1.90	1.26	.95	-.10	-.14	-.06	1.52
24	-.08	3.80	2.50	2.63	.95	1.52	1.25	.85	-.12	-.21	.00	.69
25	-.10	2.85	1.93	1.42	.78	1.64	1.06	.72	-.14	-.21	-.05	.72
26	-.08	2.26	1.55	.96	.82	1.58	.92	.64	-.14	-.18	-.24	.73
27	.10	1.95	1.29	.86	.98	1.58	.90	.48	-.12	-.19	-.28	.56
28	.30	1.55	1.03	.80	1.23	3.12	.92	.80	.48	-.18	-.34	.39
29	.36	1.28	.84	.82	-------	4.02	3.34	1.50	1.80	-.13	-.32	.16
30	.78	1.06	1.02	.88	-------	3.12	4.60	1.20	1.68	-.15	-.34	.24
31	.80	-------	.95	1.00	-------	2.46	-------	.86	-------	-.16	-.33	-------

NOTE—Stage-discharge relation Jan. 18-20 affected by ice.

Daily discharge, in second-feet, of Brokenstraw Creek at Youngsville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	248	248	418	438	338	522	1,580	2,300	282	438	50	38
2	338	248	920	1,740	338	745	1,300	1,100	206	218	62	40
3	438	620	1,230	2,060	338	1,820	860	800	206	158	80	67
4	319	695	800	1,440	282	1,660	645	695	185	125	70	63
5	170	418	745	860	338	1,040	545	695	152	115	53	53
6	132	282	1,300	745	695	2,330	479	645	138	115	70	78
7	125	227	1,100	695	645	3,630	438	418	138	105	522	55
8	115	200	745	980	545	3,000	398	358	125	95	418	43
9	105	209	500	980	645	2,060	522	319	120	146	209	40
10	100	418	438	595	745	1,740	522	300	115	112	135	50
11	90	398	378	522	695	1,230	458	248	152	90	86	200
12	102	300	378	418	545	715	398	265	378	90	90	90
13	115	248	378	358	479	1,300	378	265	194	143	78	60
14	112	230	1,040	378	458	1,160	338	300	140	115	70	50
15	90	221	1,580	358	458	800	545	265	115	82	62	46
16	86	224	1,100	300	920	800	545	319	102	70	56	40
17	74	300	620	230	2,800	745	695	221	110	67	76	88
18	72	522	500	180	2,330	745	1,370	206	115	63	80	458
19	82	595	479	170	1,580	695	1,160	194	95	70	206	338
20	72	595	438	240	800	800	695	188	78	100	120	230
21	74	860	378	479	522	1,040	620	170	70	74	78	300
22	70	1,740	438	1,300	500	1,100	458	173	72	63	65	920
23	72	3,000	1,040	1,820	458	860	522	398	70	63	78	645
24	74	2,240	1,230	1,300	398	645	522	358	67	52	90	300
25	70	1,440	860	595	338	695	438	300	63	52	80	300
26	74	1,100	695	298	338	695	378	282	63	56	48	319
27	115	920	545	358	418	695	378	224	67	55	43	219
28	170	695	438	338	522	1,660	378	338	224	56	36	197
29	188	545	358	338	------	2,420	1,820	645	800	65	38	170
30	338	438	418	378	-------	1,660	3,000	500	745	62	36	152
31	338	-------	398	418	-------	1,230	-------	358	-------	60	37	-------

NOTE—Discharge Jan. 18-20 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Oil Creek near Rouseville.

Monthly discharge of Brokenstraw Creek at Youngsville, for the year ending Sept. 30, 1921

(Drainage area 290 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	438	70	147	0.507	0.58
November	3,000	200	673	2.32	2.59
December	1,580	358	706	2.43	2.80
January	2,060	170	691	2.38	2.74
February	2,800	282	695	2.40	2.50
March	3,630	522	1,360	4.48	5.16
April	3,000	338	746	2.57	2.87
May	2,300	170	447	1.54	1.78
June	800	63	180	.621	.69
July	438	52	102	.352	.41
August	522	36	104	.359	.41
September	920	38	187	.645	.72
The year	3,630	36	497	1.71	23.25

OHIO BASIN—STATION NO. 3

TIONESTA CREEK AT BUTLER BRIDGE

Location.—At three-span steel highway bridge, about two miles above Nebraska, known as Butler Ridge, Forest County.

Drainage Area.—420 square miles.

Records Available.—July 26, 1912, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Mrs. P. S. Moore.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank is high and not subject to overflow; left begins to overflow at a stage of about 12.6 feet. Bed is composed of gravel and boulders. Control is at a riffle composed of gravel, at the upstream end of an island about 500 feet below gage; probably permanent.

Extremes of Discharge.—Maximum open-water stage during the year, 7.4 feet observed at 5 p. m. March 7 (discharge, 4,020 second-feet); a stage of 10.1 feet, estimated from hydrograph, was reached at 10 a. m. January 29, but the water was held back by an ice jam; minimum, 3.0 feet at 5 p. m. August 28 (discharge, 30 second-feet).

Ice.—Stage-discharge relation seriously affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined below 1,000 second-feet and fairly well defined between 1,000 and 5,000 second-feet. Gage read to quarter tenths once daily. Daily discharge ascertained by applying daily mean gage height, computed from a continuous daily hydrograph obtained by plotting gage heights, to rating table. Results good.

Discharge Measurements of Tionesta Creek at Butler Bridge, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
20	Apr. 20	J. M. Snavely	4.47	563
21	July 26*	H. J. McIntyre	3.28	58.4

* Measurement made by wading 250 feet above gage.

Daily Mean Gage Height, in feet, of Tionesta Creek at Butler Bridge, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.48	3.52	4.78	7.70	7.83	4.41	5.15	5.33	4.45	4.11	3.50	3.15
2	4.38	3.63	5.14	8.45	7.57	4.50	5.05	4.98	4.21	3.47	3.68	3.22
3	3.95	3.80	5.20	8.99	7.43	4.90	5.05	4.85	4.03	3.20	3.65	3.30
4	3.75	3.66	5.35	8.52	7.60	5.17	4.94	4.68	3.95	3.10	3.42	3.78
5	3.60	3.50	5.25	8.55	7.68	5.10	4.80	4.50	3.95	3.20	3.28	3.72
6	3.50	3.50	5.20	7.57	5.66	5.66	4.70	4.35	3.80	3.25	3.30	3.87
7	3.50	3.46	4.98	7.35	4.80	7.18	4.70	4.32	3.80	3.25	3.45	3.83
8	3.50	3.43	4.77	5.88	4.72	6.96	4.70	4.14	3.75	3.20	3.55	3.50
9	3.45	3.64	4.60	5.15	4.88	6.82	5.00	4.10	3.70	3.20	3.45	3.40
10	3.44	3.94	4.54	4.90	4.92	6.75	4.90	4.05	3.65	3.22	3.25	3.40
11	3.43	3.80	4.52	4.77	4.83	6.28	4.75	3.87	3.60	3.25	3.30	3.75
12	3.48	3.74	4.28	4.70	4.73	5.94	4.60	3.95	4.02	3.35	3.45	3.96
13	3.46	3.70	4.23	4.50	4.54	6.16	4.50	4.10	3.87	4.09	3.32	3.65
14	3.45	3.72	4.92	4.50	4.50	5.82	4.50	4.10	3.70	4.45	3.38	3.50
15	3.44	3.66	5.37	4.55	4.44	5.52	4.50	4.00	3.62	3.91	3.38	3.42
16	3.40	3.76	5.16	6.15	4.60	5.79	4.50	3.90	3.55	3.43	3.38	3.40
17	3.39	4.19	4.96	7.60	5.05	5.70	4.60	3.80	3.55	3.11	3.52	3.50
18	3.38	4.24	4.75	8.04	5.15	5.53	4.60	3.75	3.55	3.05	3.62	3.95
19	3.37	4.17	4.62	7.95	5.15	5.48	4.50	3.75	3.50	3.05	3.62	3.88
20	3.34	4.20	4.56	8.30	5.10	5.43	4.32	3.70	3.45	3.22	3.45	3.65
21	3.30	4.40	5.80	8.55	4.86	5.55	4.20	3.70	3.40	3.25	3.35	3.78
22	3.30	5.25	7.36	8.94	4.70	5.34	4.20	3.73	3.25	3.34	3.32	4.18
23	3.25	5.86	7.04	5.96	4.55	5.25	4.20	4.73	3.30	3.35	3.30	4.06
24	3.20	5.84	7.34	5.18	4.50	5.12	4.15	4.29	3.45	3.30	3.30	3.90
25	3.20	5.70	8.48	5.16	4.38	5.17	4.12	4.05	3.40	3.30	3.25	3.85
26	3.28	5.62	8.50	4.70	4.42	5.05	4.10	3.95	3.40	3.30	3.20	3.85
27	3.42	5.38	8.46	4.45	4.40	4.87	4.08	3.90	3.40	3.30	3.10	3.85
28	3.61	4.95	8.30	7.51	4.41	4.98	4.08	3.97	3.86	3.43	3.00	3.68
29	3.64	4.71	8.18	10.01	------	5.08	5.36	4.76	4.28	3.50	3.02	3.60
30	3.68	4.52	8.05	9.65	------	5.00	6.02	4.60	4.60	3.40	3.10	3.75
31	3.68	------	7.77	8.20	------	5.00	------	4.27	------	3.45	3.15	------

NOTE—Stage-discharge relation Dec. 19 to Jan. 7 and Jan. 16 to Feb. 7 affected by ice.

Daily discharge, in second-feet, of Tionesta Creek at Butler Bridge, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	590	136	820	400	500	520	1,130	1,340	555	355	130	51
2	520	169	1,130	2,400	440	590	1,040	990	405	122	184	64
3	285	225	1,180	1,600	400	900	1,040	860	330	60	175	80
4	208	178	1,340	1,100	400	1,130	945	740	285	42	108	218
5	160	130	1,230	950	460	1,080	820	590	285	60	76	197
6	130	130	1,180	950	500	1,730	740	490	225	70	80	253
7	130	119	990	900	650	3,740	740	460	225	70	117	237
8	130	111	780	1,970	740	3,460	740	380	208	60	145	130
9	117	172	660	1,130	900	3,180	990	355	190	60	117	103
10	114	281	625	900	900	3,180	900	330	175	64	70	103
11	111	225	590	780	860	2,490	780	253	160	70	80	208
12	125	204	460	740	780	1,970	660	285	305	92	117	289
13	119	190	433	590	625	2,360	590	355	253	355	85	175
14	117	197	900	590	590	1,850	590	355	190	555	98	130
15	114	178	1,340	625	555	1,500	590	305	166	269	98	108
16	103	211	1,130	500	660	1,850	590	265	145	111	98	103
17	101	405	945	440	1,040	1,730	660	225	145	44	136	130
18	98	433	780	380	1,130	1,500	660	208	145	36	166	285
19	96	380	600	360	1,130	1,500	590	208	130	36	166	257
20	90	405	500	460	1,080	1,440	460	190	117	64	117	175
21	80	520	460	600	860	1,610	405	190	103	70	92	216
22	80	1,230	800	2,400	740	1,340	405	200	70	90	85	405
23	70	1,970	1,400	2,000	625	1,230	405	780	80	92	80	330
24	60	1,850	1,100	1,100	590	1,080	380	460	117	80	80	265
25	60	1,730	650	800	520	1,130	355	330	103	80	70	245
26	76	1,610	460	500	520	1,040	355	285	103	80	60	245
27	108	1,390	600	400	520	860	355	265	103	80	42	245
28	163	945	500	380	520	990	355	293	249	111	30	184
29	172	740	400	440	------	1,080	1,340	780	460	130	32	160
30	184	590	460	500	------	990	2,100	660	660	103	42	208
31	184	------	440	500	------	990	------	433	------	117	51	------

NOTE—Discharge Dec. 19 to Jan. 7 and Jan. 16 to Feb. 7 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Oil Creek near Rouseville.

Monthly discharge of Tionesta Creek at Butler Bridge, for the year ending Sept. 30, 1921

(Drainage area 420 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	590	60	151	0.360	0.42
November	1,970	111	568	1.35	1.51
December	1,400	400	803	1.91	2.20
January	2,400	360	883	2.10	2.42
February	1,130	400	687	1.64	1.71
March	3,740	520	1,610	3.83	4.42
April	2,100	355	724	1.72	1.92
May	1,340	190	447	1.06	1.22
June	660	70	223	.531	.59
July	555	36	117	.279	.32
August	184	30	97.6	.232	.27
September	405	51	193	.460	.51
The year	3,740	30	542	1.29	17.51

OHIO BASIN—STATION NO. 4

OIL CREEK NEAR ROUSEVILLE

Location.—At two-span steel highway bridge, one half mile below Rouseville, Venango County.

Drainage Area.—330 square miles.

Records Available.—October 20, 1909, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Mrs. Lenna Copeland.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Left bank is high and not subject to overflow; right begins to overflow at a stage of about 9.2 feet. Bed is composed of gravel and boulders. Control is at first of a series of riffles extending from 250 to 450 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 4.6 feet at 2 a. m. April 30 (discharge, 5,560 second-feet); minimum, 0.65 foot from 9.30 a. m. August 29 to 9.15 a. m. August 31 and 9 a. m. September 1 to 9.30 a. m. September 2 (discharge, 47 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined between 50 and 10,000 second-feet. Gage read to quarter tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Oil Creek near Rouseville, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
38	Oct. 1	O. W. Hartwell	1.53	378
39	Apr. 21	J. M. Snavely	1.67	466
40	July 25	J. M. Snavely	.77	61.3

Daily Mean Gage Height, in feet, of Oil Creek near Rouseville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.48	1.25	1.55	1.53	1.52	1.78	2.95	2.98	1.33	0.97	0.80	0.65
2	1.50	1.25	2.45	2.96	1.50	2.05	2.48	2.39	1.25	.85	.98	.69
3	1.22	1.80	2.18	2.79	1.46	3.10	2.20	2.10	1.19	.85	1.05	.74
4	1.08	1.42	1.85	2.20	1.40	2.22	1.98	1.93	1.13	.84	.90	.80
5	1.00	1.25	2.05	2.00	1.51	2.12	1.88	1.83	1.05	.80	.79	.98
6	.92	1.12	2.80	2.02	2.15	3.76	1.75	1.70	1.04	.77	.75	.78
7	.90	1.05	2.15	1.90	2.05	3.98	1.68	1.61	1.00	.77	.88	.70
8	.85	1.00	1.90	2.62	2.38	3.18	1.61	1.55	.96	.83	.85	.70
9	.85	1.10	1.70	2.15	2.42	2.85	1.78	1.43	.95	.85	.84	.70
10	.84	1.80	1.66	1.68	2.22	2.78	1.78	1.35	.95	1.00	.80	.70
11	.80	1.45	1.58	1.68	2.15	2.40	1.64	1.33	.95	.93	.80	.70
12	.80	1.25	1.50	1.62	1.95	2.20	1.58	1.33	.95	1.00	.82	.70
13	.80	1.18	1.45	1.50	1.78	2.80	1.52	1.35	.95	1.23	.80	.70
14	.80	1.00	2.35	1.58	1.75	2.38	1.50	1.47	.93	1.10	.80	.70
15	.78	1.09	2.52	1.50	1.71	2.12	1.86	1.35	.89	1.10	.78	.70
16	.78	1.09	2.04	1.45	1.98	2.45	1.78	1.25	.85	.93	.75	.70
17	.78	1.40	1.88	1.38	3.30	2.15	1.78	1.25	.85	.86	.78	1.41
18	.78	1.75	1.70	1.35	2.42	2.28	2.18	1.20	.85	.90	1.08	1.22
19	.75	1.70	1.55	1.30	1.95	2.18	1.95	1.15	.85	.97	.90	.98
20	.75	1.70	1.52	1.50	1.95	2.30	1.75	1.15	.85	.87	.82	.90
21	.75	2.02	1.42	1.60	1.48	2.58	1.68	1.14	.84	.85	.80	1.15
22	.75	3.22	1.55	2.78	1.60	2.55	1.59	1.10	.81	.85	.75	1.48
23	.75	3.20	2.45	3.10	1.68	2.25	1.70	1.15	.85	.81	.75	1.15
24	.72	2.45	2.22	2.30	1.55	2.15	1.73	1.13	.84	.77	.71	1.00
25	.74	2.22	1.75	1.75	1.30	2.42	1.56	1.30	.80	.72	.70	1.12
26	.80	2.09	1.50	1.52	1.50	2.14	1.51	1.20	.83	.76	.70	1.28
27	.95	1.89	1.70	1.52	1.52	2.01	1.46	1.11	.85	.75	.68	1.10
28	1.10	1.70	1.62	1.38	1.80	2.93	1.65	1.17	.84	.75	.68	1.00
29	1.00	1.58	1.42	1.42	------	3.29	3.34	2.27	1.35	.85	.65	.92
30	1.25	1.50	1.55	1.58	------	2.60	4.15	1.88	1.05	.98	.65	.99
31	1.45	------	1.50	1.70	------	2.40	------	1.50	------	.85	.68	------

Daily discharge, in second-feet, of Oil Creek near Rouseville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	323	205	370	370	335	560	2,120	2,210	240	110	70	47
2	335	205	1,320	2,120	335	805	1,400	1,250	205	80	112	53
3	193	560	980	1,870	311	2,390	980	860	181	80	134	60
4	144	287	605	980	275	980	750	700	160	78	90	70
5	118	205	805	750	335	860	650	605	134	70	68	112
6	96	157	1,870	750	920	3,780	520	480	131	65	62	67
7	90	134	920	650	805	4,200	480	405	118	65	86	54
8	80	118	650	1,550	1,250	2,580	405	370	107	76	80	54
9	80	150	480	920	1,250	1,960	560	293	104	80	78	54
10	78	560	442	480	980	1,870	560	250	104	118	70	54
11	70	305	405	480	920	1,250	442	240	104	98	70	54
12	70	205	335	405	700	980	405	240	104	118	74	54
13	70	178	305	335	560	1,870	335	250	104	197	70	54
14	70	118	1,180	405	520	1,250	335	317	98	150	70	54
15	67	147	1,400	335	480	860	605	250	88	150	67	54
16	67	147	805	305	750	1,320	560	205	80	98	62	54
17	67	275	650	265	2,770	920	560	205	80	82	67	281
18	67	520	480	250	1,250	1,110	980	185	80	90	144	193
19	62	480	370	225	700	980	700	168	80	110	90	112
20	62	480	335	335	700	1,110	520	168	80	84	74	90
21	62	750	287	405	323	1,550	480	164	78	80	70	168
22	62	2,580	370	1,870	405	1,480	405	150	72	80	62	323
23	62	2,580	1,320	2,390	480	1,040	480	168	80	72	62	168
24	57	1,320	980	1,110	370	920	520	160	78	65	56	118
25	60	980	520	520	225	1,250	370	225	70	57	54	157
26	70	860	335	335	335	920	335	185	76	64	54	217
27	104	650	480	335	335	750	311	154	80	62	51	150
28	150	480	405	265	560	2,120	442	174	78	62	51	118
29	118	405	287	287	-------	2,770	2,770	1,040	250	80	47	96
30	205	335	370	405	-------	1,550	4,640	650	134	112	47	115
31	305	-------	335	480	-------	1,250	-------	335	-------	80	51	-------

Monthly discharge of Oil Creek near Rouseville, for the year ending Sept. 30, 1921

(Drainage area 330 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	335	57	112	0.339	0.39
November	2,580	118	546	1.65	1.84
December	1,870	287	658	2.00	2.31
January	2,390	225	716	2.17	1.50
February	2,770	225	685	2.08	2.17
March	4,200	560	1,520	4.61	5.32
April	4,640	311	821	2.49	2.78
May	2,210	150	421	1.28	1.48
June	250	70	113	.342	.38
July	197	57	90.7	.275	.32
August	144	47	72.4	.219	.25
September	323	47	108	.327	.36
The year	4,640	47	488	1.48	20.10

OHIO BASIN—STATION NO. 5

FRENCH CREEK AT KIMMEYTOWN

Location.—At single-span steel highway bridge, Kimmeytown, Erie County, about 4 miles upstream from the mouth of South Branch French Creek and about 5 miles north of Union City.

Drainage Area.—207 square miles.

Records Available.—May 16, 1910, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Mrs. J. L. Carter. Elevation of gage zero 1,235.7 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank begins to overflow at a stage of 8.2 feet; left is high and not subject to overflow. Bed is composed of gravel and boulders. Control for low water is the first of a series of riffles extending from 10 to 60 feet below gage; probably shifts occasionally.

Extremes of Discharge.—Maximum stage during the year, 7.20 feet observed at 8.40 a. m. February 17 (discharge, 3,920 second-feet); minimum, 0.64 foot at 6.30 a. m. September 3 and 4 (discharge, 21 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation probably permanent throughout the year. Rating curve fairly well defined to 5,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of French Creek at Kimmeytown, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
30	Apr. 22	J. M. Snavely	2.48	531
31	May 14	J. M. Snavely	1.32	139
32	July 27*	H. J. McIntyre	.88	34.5

* Measurement made by wading 150 feet above gage.

Daily Mean Gage Height, in feet, of French Creek at Kimmeytown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.30	1.60	2.32	2.42	1.87	2.08	3.84	4.38	1.17	1.91	0.82	0.74
2	3.02	1.58	4.52	5.61	1.86	3.03	3.17	3.40	.95	1.33	.82	.74
3	3.33	2.96	4.07	4.76	1.52	4.64	2.51	2.79	.98	1.12	.92	.66
4	2.31	2.97	3.04	3.51	1.55	3.39	2.13	3.56	.94	1.02	.94	.66
5	1.47	2.35	3.20	3.10	2.06	3.05	1.91	2.73	.95	.94	.90	.70
6	1.24	1.80	4.35	2.80	2.80	4.57	1.79	2.21	.94	.90	.82	.70
7	1.10	1.60	3.64	2.60	2.67	5.97	1.61	1.86	.92	.88	1.51	.70
8	1.02	1.42	2.86	3.45	2.30	4.75	1.59	1.68	.92	.87	1.25	.70
9	.98	1.45	2.29	3.00	2.32	4.07	2.57	1.54	.86	.94	.98	.74
10	.94	1.88	2.10	2.30	2.60	4.06	2.48	1.38	.82	1.05	.94	.78
11	.92	1.87	1.90	2.13	2.40	3.22	2.13	1.35	.85	1.08	.83	.82
12	.95	1.63	1.96	1.98	2.20	2.61	1.79	1.31	1.03	.96	.87	.80
13	.94	1.49	2.35	1.83	2.02	3.29	1.70	1.32	.96	1.03	1.10	.78
14	.98	1.38	4.12	1.86	2.00	2.97	1.56	1.32	.85	1.02	1.00	.76
15	.96	1.36	3.97	1.82	1.88	2.43	2.05	1.28	.82	.94	.94	.78
16	.90	1.38	3.00	1.70	3.18	2.58	2.09	1.20	.82	1.04	.83	.77
17	.81	1.80	2.30	1.62	6.49	2.47	4.05	1.14	.82	.98	.87	1.15
18	.85	2.32	2.20	2.18	3.96	2.86	5.12	1.09	.94	.88	1.25	1.52
19	.82	2.42	2.14	3.80	2.80	2.45	3.82	1.07	.92	.86	1.11	1.15
20	.82	2.56	2.10	3.57	2.23	2.38	2.79	1.07	.82	1.35	1.02	.93
21	.84	3.50	2.15	4.16	2.04	2.62	2.23	1.03	.80	1.29	.94	.98
22	.80	5.41	2.14	4.78	1.84	2.81	2.38	.98	.78	1.05	.88	1.27
23	.80	5.28	3.51	4.46	1.82	2.33	2.60	1.05	.78	.94	.82	1.09
24	.82	4.35	3.83	3.24	1.58	2.11	2.78	1.64	.78	.87	.82	.94
25	.82	3.79	3.13	2.24	1.62	2.07	2.22	1.57	.78	.88	.82	.98
26	.82	3.52	2.88	2.05	1.68	2.02	1.91	1.45	.78	.80	.74	1.29
27	.89	3.79	2.78	1.92	1.64	2.23	1.73	1.25	.78	.82	.78	1.10
28	1.06	3.08	2.28	1.69	2.02	4.98	1.75	1.32	2.00	.82	.78	.98
29	1.85	2.45	2.29	1.62	-------	4.62	4.32	1.75	3.87	.85	.78	.94
30	2.65	2.05	2.23	1.74	-------	3.71	5.75	1.62	3.17	.88	.74	.98
31	2.20	-------	2.00	1.77	-------	3.12	-------	1.34	-------	.83	.74	-------

NOTE—Stage-discharge relation Jan. 18-20 affected by ice.

Daily discharge, in second feet, of French Creek at Kimmeytown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	135	215	435	470	290	365	1,130	1,510	104	305	43	32
2	700	215	1,580	2,420	290	700	790	895	62	142	43	32
3	840	700	1,310	1,790	185	1,650	505	620	67	94	58	23
4	435	700	700	950	200	895	382	1,010	61	74	61	23
5	178	452	790	745	350	700	305	580	62	61	55	26
6	120	275	1,510	620	620	1,650	275	400	61	55	43	26
7	90	215	1,010	540	580	2,780	215	290	58	52	185	26
8	74	165	660	895	435	1,790	215	245	58	50	122	26
9	67	172	435	700	435	1,310	540	200	49	61	67	32
10	61	305	365	435	540	1,310	505	155	43	80	61	37
11	58	290	305	382	470	790	382	148	48	86	44	43
12	62	230	320	335	400	540	275	138	76	64	50	40
13	61	182	452	290	335	840	245	140	64	76	90	37
14	67	155	1,310	290	335	700	200	140	48	74	70	34
15	64	150	1,250	275	305	488	350	130	43	61	61	37
16	55	155	700	245	790	540	365	110	43	78	44	36
17	42	275	435	215	3,230	488	1,250	98	43	67	50	100
18	48	435	400	200	1,250	660	2,000	88	61	52	122	185
19	43	470	382	180	620	488	1,130	84	58	49	92	100
20	43	540	365	500	418	470	620	84	43	148	74	60
21	46	950	382	1,370	350	540	418	76	40	132	61	67
22	40	2,240	382	1,790	290	620	470	67	37	80	52	128
23	40	2,160	950	1,580	275	452	540	80	37	61	43	88
24	43	1,510	1,130	790	215	365	620	230	37	50	43	61
25	43	1,130	745	418	215	350	400	200	37	52	43	67
26	43	950	660	350	245	335	305	172	37	40	32	132
27	54	1,130	620	305	230	418	260	122	37	43	37	90
28	82	745	435	245	335	1,930	260	140	335	43	37	67
29	290	488	435	215	-------	1,650	1,440	260	1,190	48	37	61
30	540	350	418	260	-------	1,070	2,600	215	790	52	32	67
31	400	-------	335	260	-------	745	-------	145	-------	44	32	-------

NOTE.—Discharge Jan. 18-20 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Oil Creek near Rouseville.

Monthly discharge of French Creek at Kimmeytown, for the year ending Sept. 30, 1921

(Drainage area 207 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	840	40	157	0.758	0.87
November	2,240	150	598	2.89	3.22
December	1,580	305	684	3.30	3.80
January	2,420	180	647	3.13	3.61
February	3,230	215	508	2.45	2.55
March	2,780	335	891	4.30	4.96
April	2,600	200	633	3.06	3.41
May	1,510	67	283	1 37	1.58
June	1,190	37	124	.599	.67
July	305	40	76.6	.370	.43
August	185	32	60.8	.294	.34
September	185	23	59.4	.287	.32
The year	3,230	23	393	1.90	25.76

OHIO BASIN—STATION NO. 6

FRENCH CREEK AT SAEGERTOWN

Location.—At single-span steel highway bridge, at lower end of Saegertown, Crawford County, about one half mile upstream from the mouth of Woodcock Creek.

Drainage Area.—586 square miles.

Records Available.—April 23, 1921, to September 30, 1921. Discharge measurements have been made at this station since August 5, 1915.

Gage.—Standard chain attached to upstream side of bridge; read by Frank L. Peters.

Discharge Measurements.—Made from upstream side of bridge.

Channel and Control.—Right bank begins to overflow at a stage of 13 feet; left is high and not subject to overflow. Bed is composed of gravel and boulders. Control is at a riffle, about 700 feet below gage, at the head of an island; probably permanent.

Extremes of Discharge.—Maximum stage during the period April 23 to September 30, 8.30 feet observed at 7 a. m. May 1 (discharge, 5,070 second-feet); minimum, normal flow stage during the period, 2.20 feet at 7 a. m. June 26 (discharge, 53 second-feet); a gage height of 2.08 feet was observed at 7.15 a. m. August 27 (discharge, 36 second-feet), but a part of the stream flow was being held back temporarily at the Venango Borough Dam.

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the period. Rating curve well defined below 2,000 second-feet and fairly well defined between 2,000 and 9,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of French Creek at Saegertown, during the period Aug. 5, 1915, to Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
	1915		Feet	Sec.-ft.
1	Aug. 5	E. E. Haslam & C. B. McElrath	10.56	9,010
2	6	C. B. McElrath & S. H. Miller	9.90	7,550
3	7	C. B. McElrath & S. H. Miller	6.52	2,980
4	9	C. B. McElrath	7.06	3,440
5	10	C. B. McElrath,	5.32	1,960
6	16	R. J. Ferris	4.98	1,680
7	Sept. 13	R. J. Ferris	2.75	225
	1916			
8	May 18	C. B. McElrath	3.26	581
9	18	C. B. McElrath	3.26	551
10	18	C. B. McElrath	3.25	551
11	23	R. J. Ferris	4.59	1,480
	1920			
12	June 12	J. M. Snavely and R. J. Ferris	2.57	159
13	Oct. 23	R. J. Ferris	2.44	118
	1921			
14	Apr. 23	J. M. Snavely	4.52	1,270
15	May 14	J. M. Snavely	3.24	509
16	July 27	H. J. McIntyre	2.46	118

Daily Mean Gage Height, in feet, of French Creek at Saegertown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								7.91	2.99	3.91	2.46	2.30
2								6.20	2.84	3.20	2.44	2.26
3								5.20	2.74	2.88	2.46	2.27
4								5.05	2.64	2.71	2.50	2.28
5								4.99	2.62	2.58	2.54	2.27
6								4.38	2.58	2.56	2.46	2.30
7								3.98	2.59	2.49	2.56	2.29
8								3.72	2.54	2.56	2.79	2.28
9								3.50	2.50	2.58	2.72	2.27
10								3.32	2.51	2.67	2.56	2.29
11								3.26	2.47	2.78	2.46	2.59
12								3.16	2.65	2.82	2.48	2.70
13								3.08	2.74	3.86	2.48	2.51
14								3.23	2.62	3.14	2.59	2.45
15								3.12	2.57	3.00	2.53	2.33
16								3.05	2.46	2.81	2.46	2.36
17								2.97	2.45	2.64	2.46	2.44
18								2.93	2.46	2.58	2.70	2.71
19								2.90	2.48	2.60	2.80	2.96
20								2.86	2.46	2.60	2.71	2.76
21								2.81	2.46	2.72	2.66	2.72
22								2.71	2.44	2.77	2.53	3.25
23							4.53	2.89	2.53	2.62	2.42	3.18
24							4.64	2.97	2.42	2.50	2.43	2.82
25							4.34	3.22	2.37	2.52	2.58	2.68
26							3.98	3.15	2.25	2.43	2.32	2.71
27							3.82	3.02	2.34	2.42	2.21	2.85
28							4.12	2.97	2.46	2.43	2.34	2.62
29							5.40	3.50	3.85	2.44	2.35	2.59
30							7.96	3.53	4.96	2.39	2.32	2.56
31								3.18		2.39	2.33	

Daily discharge, in second-feet, of French Creek at Saegertown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								4,550	384	965	122	72
2								2,730	299	510	114	64
3								1,880	246	320	122	66
4								1,730	197	231	136	68
5								1,730	188	170	153	66
6								1,310	170	161	122	72
7								1,030	174	132	161	70
8								835	153	161	272	68
9								705	136	170	236	66
10								575	140	212	161	70
11								542	125	267	122	174
12								480	202	288	129	226
13								450	246	965	129	140
14								542	188	480	174	118
15								450	165	390	149	94
16								420	122	282	122	89
17								372	118	197	122	114
18								349	122	170	226	231
19								331	129	178	277	366
20								309	122	178	231	257
21								282	122	236	207	236
22								231	114	262	149	542
23							1,380	326	149	188	107	510
24							1,450	372	107	136	111	288
25							1,240	510	92	144	170	216
26							1,030	480	62	111	78	231
27							900	390	83	107	55	304
28							1,100	372	122	111	83	188
29							2,040	705	900	114	86	174
30							4,680	705	1,730	97	78	161
31								510		97	80	

Monthly discharge of French Creek at Saegertown, for the year ending Sept. 30, 1921

(Drainage area 586 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
April, 23-30	4,680	900	1,730	2.95	0.88
May	4,550	231	845	1.44	1.66
June	1,730	62	237	.404	.45
July	965	97	259	.442	.51
August	277	55	145	.247	.28
September	542	64	178	.304	.34

OHIO BASIN—STATION NO. 7

CUSSEWAGO CREEK NEAR MEADVILLE

Location.—At single-span steel highway bridge near Jones' Farm, about four and one-half miles northwest of Meadville, Crawford County.

Drainage Area.—88 square miles.

Records Available.—May 3, 1910, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Thomas McCay. Elevation of gage zero 1,071.77 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are subject to overflow; the right begins to overflow at a stage of about 8.6 feet and the left at a stage of about 9.1 feet. Bed is composed of sand, gravel and boulders. Low-water control is a gravel bar 5 feet below gage; practically permanent. Control for medium and high stages is an old dam about 4 miles below gage.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 9.9 feet at 9 p. m. November 23 and 8 p. m. March 7 (discharge, 896 second-feet); minimum, 0.47 foot at 7 a. m. September 8 (discharge, 1.3 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined below 900 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Cussewago Creek near Meadville, during the year ending Sept. 30, 1921

No.	Date	Made by—	height Gage	Discharge
			Feet	Sec.-ft.
31	Oct. 2	O. W. Hartwell	1.49	18.1
32	23	R. J. Ferris	.69	2.73
33	Apr. 22	J. M. Snavely	3.49	108
34	May 13	J. M. Snavely	2.13	20.7
35	July 28	H. J. McIntyre	.76	3.87

Daily Mean Gage Height, in feet of Cussewago Creek near Meadville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.00	4.03	3.62	4.44	3.05	4.33	7.47	8.48	2.04	1.03	0.68	0.50
2	1.41	3.43	6.91	7.33	2.68	5.07	7.36	8.48	1.64	.95	.76	.50
3	1.84	4.92	8.65	8.83	2.56	7.02	5.66	6.60	1.44	.76	.92	.50
4	1.77	5.74	9.19	9.28	2.50	7.66	4.12	4.34	1.26	.66	.98	.52
5	1.42	4.54	8.36	7.72	2.99	6.67	3.44	4.00	1.15	.56	.85	.50
6	1.18	3.06	7.92	5.74	5.18	7.32	3.06	3.46	1.09	.54	.74	.50
7	1.04	2.30	8.12	5.15	6.84	9.03	2.76	2.90	1.02	.54	1.37	.49
8	.96	2.00	7.90	5.42	7.14	9.66	2.60	2.54	.98	.58	1.39	.48
9	.88	1.90	5.34	6.22	7.28	9.06	3.77	2.26	.94	.74	1.23	.50
10	.82	2.06	3.56	4.86	7.54	8.26	5.32	2.04	.90	1.31	.98	.50
11	.78	2.18	3.35	3.50	7.68	7.76	4.82	2.33	.88	1.38	.84	.64
12	.76	1.93	3.51	3.04	6.25	6.26	4.11	2.24	.98	1.57	1.22	.58
13	.76	1.78	3.86	3.01	5.03	5.62	3.45	2.17	.92	1.40	.94	.51
14	.80	1.59	5.32	2.77	4.56	6.42	2.98	2.18	1.08	1.06	.81	.50
15	.78	1.56	6.56	2.82	4.30	5.52	3.40	2.29	.96	1.20	.73	.50
16	.72	1.60	6.15	2.90	4.92	5.08	4.58	2.17	.84	1.45	.68	.48
17	.66	1.92	4.20	2.68	7.69	5.24	5.32	2.03	.80	1.60	.66	1.13
18	.62	3.11	3.37	2.46	9.56	5.00	7.32	1.94	.76	1.16	1.06	1.24
19	.62	4.94	3.88	2.34	8.67	5.22	8.29	1.89	.72	.95	1.35	1.18
20	.67	5.12	3.78	2.28	5.85	4.50	7.55	1.84	.68	1.02	1.56	1.10
21	.68	5.92	3.59	3.56	3.97	6.15	4.67	1.77	.64	1.10	1.24	1.26
22	.66	7.54	3.67	6.61	3.40	6.94	3.58	1.70	.62	.96	1.02	1.52
23	.68	8.97	5.64	7.76	3.08	6.48	3.69	1.77	.60	.81	.86	1.18
24	.68	9.42	7.19	8.01	3.21	4.65	4.79	2.32	.60	.68	.74	1.00
25	.70	8.74	7.82	6.67	3.15	3.96	4.32	2.51	.64	.66	.70	1.08
26	.72	7.95	7.77	4.48	3.04	4.02	3.36	2.86	.66	.65	.64	1.31
27	.85	7.48	5.67	3.07	2.74	4.18	3.70	2.42	.63	.65	.60	1.32
28	1.00	6.72	4.37	2.31	3.58	6.93	4.72	2.34	.77	.72	.58	1.16
29	1.32	5.01	4.18	2.02	------	9.23	6.33	3.54	.90	.67	.54	1.00
30	2.92	3.82	3.79	2.56	------	9.28	7.68	4.64	.91	.70	.53	.92
31	4.10	------	3.52	3.03	------	8.44	------	3.12	------	.85	.50	------

Daily discharge, in second-feet, of Cussewago Creek near Meadville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.0	127	103	151	72	145	437	610	34	7.6	2.7	1.4
2	15	92	352	407	58	193	422	610	22	6.2	3.5	1.4
3	28	181	629	667	52	365	234	316	16	3.5	5.7	1.4
4	24	234	745	765	50	469	133	145	12	2.5	6.7	1.5
5	16	157	592	469	72	328	92	127	10	1.8	4.6	1.4
6	11	77	502	234	199	407	77	97	8.8	1.6	3.3	1.4
7	7.8	42	538	199	340	705	60	67	7.4	1.6	14	1.4
8	6.3	32	502	213	379	849	54	52	6.7	1.9	15	1.3
9	5.1	29	206	275	407	725	115	40	6.0	3.3	12	1.4
10	4.2	34	103	181	437	574	206	34	5.4	13	6.7	1.4
11	3.7	38	92	97	469	485	175	44	5.1	15	4.5	2.3
12	3.5	30	97	72	275	285	133	40	6.7	19	11	1.9
13	3.5	26	121	72	187	227	92	30	5.7	15	6.0	1.5
14	4.0	20	206	60	163	295	72	38	8.6	8.2	4.1	1.4
15	3.7	19	316	62	145	220	92	42	6.3	11	3.2	1.4
16	3.1	20	275	67	181	193	163	36	4.5	16	2.7	1.3
17	2.5	29	139	58	469	199	206	34	4.0	20	2.5	9.6
18	2.2	77	92	48	827	187	407	30	3.5	10	8.2	12
19	2.2	181	121	44	648	199	574	29	3.1	6.2	14	11
20	2.6	193	115	42	241	157	453	28	2.7	7.4	19	9.0
21	2.7	249	103	103	127	275	169	24	2.3	9.0	12	12
22	2.5	437	109	316	92	352	103	23	2.2	6.3	7.4	18
23	2.7	705	227	485	77	305	109	24	2.0	4.1	4.8	11
24	2.7	785	393	520	82	163	175	42	2.0	2.7	3.3	7.0
25	2.9	648	485	328	82	127	145	50	2.3	2.5	2.9	8.6
26	3.1	520	485	157	72	127	92	64	2.5	2.4	2.3	13
27	4.6	437	234	77	60	139	109	46	2.3	2.4	2.0	13
28	7.0	328	151	42	103	352	169	44	3.6	3.1	1.9	10
29	13	187	139	32	------	745	285	97	5.4	2.6	1.6	7.0
30	67	115	115	44	------	765	469	163	5.5	2.9	1.6	5.7
31	133	------	97	72	------	592	------	77	------	4.6	1.4	------

Monthly discharge of Cussewago Creek near Meadville, for the year ending Sept. 30, 1921

(Drainage area 88 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	133	2.2	12.8	0.145	0.17
November	785	19	202	2.30	2.57
December	745	92	270	3.07	3.54
January	765	32	205	2.33	2.69
February	827	50	227	2.58	2.69
March	849	127	360	4.09	4.72
April	574	54	201	2.28	2.54
May	610	23	100	1.14	1.31
June	34	2.0	6.95	.079	.09
July	20	1.6	6.88	.078	.09
August	19	1.4	6.15	.070	.08
September	18	1.3	5.69	.065	.07
The year	849	1.3	133	1.51	20.56

OHIO BASIN—STATION NO. 8

FRENCH CREEK AT CARLTON

Location.—At two-span steel highway bridge, Carlton, Mercer County.

Drainage Area.—1,000 square miles.

Records Available.—April 29, 1908, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by R. Z. Parrish and Charles Coefield. Elevation of gage zero 1,033.60 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank is high and not subject to overflow; left is of medium height and overflow begins at a stage of about 10 feet. Bed is composed of sand, gravel and boulders. Control is at a riffle at the measuring section; practically permanent.

Extremes of Discharge.—Maximum stage during the year, 8.0 feet observed at 5 p. m. March 8 (discharge, 8,550 second-feet); minimum, 0.3 foot from August 28 to September 2 (discharge, 115 second-feet.

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined below 3,000 second-feet and well defined between 3,000 and 13,000 second-feet. Gage read to half tenths twice daily ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of French Creek at Carlton, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
60	Oct. 2	R. J. Ferris	1.63	716
61	Apr. 21	J. M. Snavely	3.70	2,350
62	July 28	J. M. Snavely	.67	141

Daily Mean Gage Height, in feet, of French Creek at Carlton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.02	2.35	2.98	2.8	2.25	2.97	5.87	7.12	1.87	2.67	0.8	0.3
2	1.6	1.95	4.72	4.93	2.05	3.53	5.5	6.0	1.5	1.77	.9	.3
3	2.6	2.64	5.76	6.90	1.85	5.44	4.53	4.75	1.37	1.40	1.22	.38
4	2.5	3.2	5.2	6.49	1.82	5.68	3.5	3.9	1.20	1.13	.98	.4
5	2.1	2.82	4.78	5.08	2.11	4.67	3.3	4.05	1.05	.87	.85	.42
6	1.52	2.3	5.88	4.35	3.43	6.31	2.9	3.45	.93	.77	.78	.4
7	1.22	1.85	5.6	3.88	4.17	7.57	2.63	2.9	.85	.67	1.38	.4
8	1.08	1.52	4.75	4.3	4.2	7.97	2.45	2.53	.8	.67	1.28	.35
9	.85	1.38	3.9	4.65	4.65	7.43	2.73	2.27	.73	1.03	1.2	.35
10	.7	1.45	3.12	3.78	4.87	6.55	3.5	2.03	.67	1.4	1.1	.35
11	.65	1.7	2.72	3.1	4.4	5.7	3.3	1.85	.65	1.25	.92	.48
12	.6	1.65	2.6	2.68	3.93	4.73	2.97	1.67	.67	1.15	.9	.82
13	.58	1.48	2.6	2.18	3.43	4.75	2.65	1.65	.9	1.94	.82	.78
14	.55	1.32	3.67	2.3	3.2	4.85	2.37	1.67	.87	2.11	.7	.62
15	.55	1.2	5.08	2.22	3.07	4.23	2.55	1.63	.77	1.65	.7	.52
16	6	1.18	4.57	1.98	3.61	4.03	2.97	1.47	.67	1.4	.7	.45
17	.6	1.3	3.82	1.62	6.28	3.95	3.93	1.45	.6	1.12	.7	.92
18	.55	1.98	2.95	1.82	7.17	3.9	5.98	1.4	.57	.88	1.12	1.45
19	.5	2.78	2.55	2.45	6.17	3.9	6.07	1.35	.65	.8	1.32	1.38
20	.52	2.95	2.5	2.38	4.4	3.55	4.97	1.25	.63	1.02	1.22	1.35
21	.45	3.65	2.62	2.70	3.4	4.1	3.85	1.17	.55	.95	1.12	1.35
22	.48	5.72	2.73	4.67	2.9	4.47	3.2	1.13	.55	.98	.9	1.82
23	.4	6.7	3.99	6.18	2.73	3.9	3.25	1.17	.63	.95	.8	2.0
24	.45	6.7	4.96	5.72	2.53	3.4	3.43	1.27	.63	.8	.68	1.42
25	.4	5.85	4.02	4.0	2.23	3.37	3.15	1.6	.53	.72	.62	1.3
26	.42	5.25	3.79	2.65	2.0	3.33	2.7	1.7	.47	.8	.6	1.25
27	.52	5.18	3.62	2.42	2.3	3.25	2.65	1.53	.37	.65	.48	1.2
28	.55	4.58	3.08	2.1	2.65	5.45	2.95	1.5	.4	.7	.3	1.2
29	.7	3.75	2.68	2.05	-------	7.08	4.71	2.17	.97	1.00	.3	1.0
30	1.43	3.15	2.58	2.1	-------	6.9	6.82	2.43	2.82	1.05	.3	.85
31	2.43	-------	2.8	2.3	-------	5.77	-------	2.25	-------	1.05	.3	-------

NOTE—Stage-discharge relation Jan. 18-20 affected by ice.

Daily discharge, in second-feet, of French Creek at Carlton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	375	1,300	1,790	1,620	1,140	1,790	5,110	6,990	885	1,540	280	115
2	710	955	3,540	3,780	990	2,250	4,550	5,260	650	815	325	115
3	1,460	1,460	4,970	6,650	885	4,420	3,310	3,660	560	590	475	135
4	1,380	1,970	4,160	6,010	850	4,830	2,250	2,650	475	450	365	140
5	1,060	1,620	3,660	4,030	1,060	3,540	2,060	2,760	400	312	302	146
6	650	1,220	5,110	3,200	2,150	5,710	1,700	2,150	340	268	272	140
7	475	885	4,690	2,650	2,980	7,840	1,460	1,700	302	230	590	140
8	425	650	3,660	3,090	2,980	8,550	1,300	1,380	280	230	530	128
9	302	590	2,650	3,420	3,420	7,500	1,540	1,220	252	400	475	128
10	240	620	1,880	2,550	3,780	6,170	2,250	990	230	590	425	128
11	222	780	1,540	1,880	3,200	4,830	2,060	885	222	502	335	164
12	205	745	1,460	1,540	2,650	3,540	1,790	745	230	450	325	289
13	198	650	1,460	1,140	2,150	3,660	1,460	745	325	955	289	272
14	188	530	2,450	1,220	1,970	3,660	1,300	745	312	1,060	240	212
15	188	475	4,030	1,140	1,880	2,980	1,460	745	268	745	240	177
16	205	475	3,420	990	2,350	2,760	1,790	620	230	590	240	155
17	205	530	2,550	710	5,710	2,760	2,650	620	205	425	240	335
18	188	900	1,790	650	7,160	2,650	5,260	590	194	316	425	620
19	170	1,620	1,460	600	5,560	2,650	5,410	560	222	280	530	590
20	177	1,790	1,380	800	3,200	2,350	3,900	502	215	375	475	560
21	155	2,350	1,460	1,540	2,150	2,870	2,550	450	188	350	425	560
22	164	4,830	1,540	3,540	1,700	3,310	1,970	450	188	368	325	850
23	140	6,330	2,760	5,560	1,540	2,650	1,970	450	215	350	280	990
24	155	6,330	3,900	4,830	1,380	2,150	2,150	502	215	280	233	590
25	140	4,970	2,760	2,760	1,140	2,150	1,970	710	180	248	212	530
26	146	4,160	2,550	1,460	990	2,060	1,540	780	161	280	205	502
27	177	4,160	2,350	1,300	1,220	1,970	1,460	680	132	222	164	475
28	188	3,420	1,880	1,060	1,460	4,420	1,790	650	140	240	115	475
29	240	2,550	1,540	990	-------	6,990	3,540	1,140	360	375	115	375
30	620	1,970	1,460	1,060	-------	6,650	6,490	1,300	1,620	400	115	302
31	1,300	-------	1,620	1,220	-------	4,970	-------	1,140	-------	400	115	-------

Note—Discharge Jan. 18-20 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for French Creek at Kimmeytown and Cussewago Creek near Meadville.

Monthly discharge of French Creek at Carlton, for the year ending Sept. 30, 1921

(Drainage area 1,000 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,460	140	402	0.402	0.46
November	6,330	475	2,030	2.03	2.26
December	5,110	1,380	2,630	2.63	3.03
January	6,650	600	2,350	2.35	2.71
February	7,160	850	2,420	2.42	2.52
March	8,550	1,790	4,020	4.02	4.64
April	6,490	1,300	2,600	2.60	2.90
May	6,990	450	1,410	1.41	1.63
June	1,620	132	340	.340	.38
July	1,540	222	472	.472	.54
August	590	115	312	.312	.36
September	990	115	345	.345	.38
The year	8,550	115	1,610	1.61	21.81

OHIO BASIN—STATION NO. 9

ALLEGHENY RIVER AT FRANKLIN

Location.—At four-span steel highway bridge, Eighth Street, Franklin, Venango County.

Drainage Area.—6,010 square miles.

Records Available.—April 1, 1905, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge in first span from left end; read by W. C. Rivers. Elevation of gage zero 958.26 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge.

Channel and Control.—Both banks are high and do not overflow until a stage of 22 feet is reached. Bed is composed of gravel and boulders. Control is at a riffle. 200 feet long, about 1,000 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 9.9 feet at 10 p. m. March 7 (discharge, 49,600 second-feet); minimum, 0.09 foot on September 2 (discharge, 970 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined between 1,000 and 110,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Cooperation.—Station is maintained in cooperation with United States Engineer Office, Pittsburgh.

Discharge Measurements of Allegheny River at Franklin, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
15	Oct. 2	R. J. Ferris	1.70	4,300
16	Mar. 17	J. M. Snavely	4.87	18,400
17	July 25	J. M. Snavely	.68	1,600

Daily Mean Gage Height, in feet, of Allegheny River at Franklin, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.10	1.48	3.27	2.93	2.50	2.96	5.83	6.95	2.63	2.43	0.63	0.10
2	1.80	1.34	4.02	4.11	2.31	3.26	5.73	5.97	2.26	1.95	.74	.09
3	2.26	1.70	5.28	6.22	2.18	5.07	5.09	5.07	1.97	1.47	.86	.12
4	2.22	1.96	5.22	5.89	2.10	5.92	4.38	4.35	1.77	1.11	.76	.18
5	1.82	2.03	4.86	4.99	2.22	5.27	3.87	4.09	1.57	.87	.65	.77
6	1.42	1.80	5.42	4.55	2.96	6.19	3.51	3.62	1.41	.71	.56	.47
7	1.13	1.51	5.27	4.12	3.50	8.77	3.22	3.23	1.29	.61	.89	.66
8	.94	1.29	4.67	4.58	3.58	9.75	2.98	2.92	1.17	.57	2.09	.57
9	.80	1.14	4.02	4.66	3.74	8.74	3.06	2.67	1.08	.64	1.46	.40
10	.70	1.26	3.48	4.22	3.98	8.49	3.65	2.51	.99	.77	1.18	.30
11	.62	1.56	3.16	3.52	3.87	7.73	3.80	2.29	.94	.85	1.09	.48
12	.58	1.65	2.92	3.22	3.55	6.66	3.43	2.12	1.03	.89	.94	.87
13	.56	1.48	2.80	2.84	3.20	6.61	3.14	2.02	1.41	.95	.78	.83
14	.56	1.32	3.33	2.71	2.96	6.28	2.91	1.98	1.19	1.21	.75	.62
15	.54	1.20	5.48	2.65	2.86	5.49	2.93	1.93	1.09	1.19	.74	.54
16	.50	1.14	5.60	2.46	3.02	5.09	3.07	1.81	.94	1.09	.66	.44
17	.44	1.40	4.72	2.24	5.93	4.90	3.20	1.67	.81	.83	.62	.67
18	.39	1.85	4.06	1.78	7.85	4.72	4.51	1.56	.77	.78	.88	2.34
19	.34	2.22	3.56	1.40	6.54	4.47	5.05	1.46	.72	.73	.86	3.15
20	.32	2.42	3.10	1.40	5.42	4.33	4.38	1.37	.65	.78	.83	2.78
21	.29	2.84	2.75	2.18	4.17	4.85	3.71	1.25	.59	.87	.76	2.24
22	.28	4.79	2.84	3.94	3.60	5.17	3.23	1.17	.54	1.55	.67	2.57
23	.26	7.11	3.55	5.79	3.30	4.79	3.23	1.25	.59	1.19	.54	2.98
24	.25	7.30	4.78	5.68	3.01	4.25	3.49	2.42	.51	.89	.42	2.41
25	.24	6.76	4.46	4.28	2.55	4.15	3.79	2.71	.45	.69	.36	1.98
26	.24	6.04	3.68	3.10	2.34	4.07	3.40	2.49	.41	.63	.32	2.14
27	.32	5.52	3.34	2.64	2.41	3.96	3.11	2.27	.37	.52	.30	2.10
28	.49	4.78	3.00	2.48	2.80	4.77	3.14	2.15	.41	.48	.24	1.84
29	.64	4.10	2.56	2.40	------	6.56	4.61	2.97	.97	.86	.17	1.56
30	.86	3.56	2.48	2.56	------	6.23	7.57	3.49	2.39	.82	.12	1.34
31	1.36	------	2.70	2.75	------	5.57	------	3.09	------	.72	.11	------

Daily discharge, in second-feet, of Allegheny River at Franklin, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,720	3,890	10,500	8,910	7,380	9,300	22,800	30,000	7,760	7,010	1,720	970
2	4,880	3,430	13,300	15,300	6,640	10,500	22,200	24,000	6,640	5,570	1,910	970
3	6,640	4,540	19,800	25,200	6,280	18,800	18,800	18,800	5,570	3,740	2,120	970
4	6,280	5,570	19,300	23,400	5,920	23,400	15,300	15,300	4,880	2,720	1,910	1,080
5	4,880	5,570	17,800	18,300	6,280	19,800	12,900	13,800	4,210	2,120	1,720	1,910
6	3,580	4,880	20,400	16,300	9,300	25,200	11,300	11,700	3,580	1,810	1,550	1,400
7	2,860	3,890	19,800	13,800	11,300	41,900	10,100	10,100	3,280	1,630	2,230	1,720
8	2,350	3,280	16,800	15,300	11,700	48,900	9,300	8,910	2,860	1,550	5,920	1,550
9	2,010	2,860	13,300	16,800	12,100	41,200	9,700	8,140	2,720	1,720	3,740	1,330
10	1,810	3,140	11,300	14,300	13,300	39,800	11,700	7,380	2,470	1,910	2,990	1,200
11	1,630	4,210	10,100	11,300	12,900	34,200	12,500	6,640	2,350	2,120	2,720	1,470
12	1,630	4,210	8,910	10,100	11,700	28,200	10,900	5,920	2,600	2,230	2,350	2,120
13	1,550	3,890	8,520	8,520	10,100	27,600	9,700	5,570	3,580	2,350	2,010	2,120
14	1,550	3,280	10,500	8,140	9,300	25,800	8,910	5,570	2,990	2,990	1,910	1,630
15	1,550	2,990	21,000	7,760	8,910	21,000	8,910	5,220	2,720	2,990	1,910	1,550
16	1,470	2,860	21,600	7,380	9,300	18,800	9,700	4,880	2,350	2,720	1,720	1,400
17	1,400	3,580	16,800	6,280	23,400	17,800	10,100	4,540	2,010	2,120	1,630	1,720
18	1,330	4,880	13,800	4,880	34,900	16,800	15,800	4,210	1,910	2,010	2,230	6,640
19	1,260	6,280	11,700	3,580	27,000	15,800	18,300	3,740	1,810	1,910	2,120	10,100
20	1,200	7,010	9,700	3,580	20,400	14,800	15,300	3,430	1,720	2,010	2,120	8,520
21	1,200	8,520	8,520	6,280	14,300	17,300	12,100	3,140	1,630	2,120	1,916	6,280
22	1,200	17,300	8,520	12,900	11,700	19,300	10,100	2,860	1,550	4,210	1,720	7,760
23	1,140	30,600	11,700	22,800	10,500	17,300	10,100	3,140	1,630	2,990	1,550	9,300
24	1,140	31,800	17,300	22,200	9,300	14,300	11,300	7,010	1,470	2,230	1,330	7,010
25	1,110	28,800	15,800	14,800	7,760	14,300	12,500	8,140	1,400	1,810	1,260	5,570
26	1,140	24,000	12,100	9,700	6,640	13,800	10,900	7,380	1,330	1,720	1,200	5,920
27	1,200	21,000	10,500	7,760	7,010	13,300	9,700	6,640	1,260	1,470	1,200	5,920
28	1,470	17,300	9,300	7,380	8,520	17,300	9,700	6,280	1,330	1,470	1,140	4,880
29	1,720	13,800	7,760	7,010	------	27,600	16,300	9,300	2,350	2,120	1,020	4,210
30	2,120	11,700	7,380	7,760	------	25,200	33,600	11,300	7,010	2,010	970	3,430
31	3,430	------	8,140	8,520	------	21,600	------	9,700	------	1,810	970	------

Monthly discharge of Allegheny River at Franklin, for the year ending Sept. 30, 1921

(Drainage area 6,010 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	6,640	1,140	2,240	0.373	0.43
November	31,800	2,860	9,640	1.60	1.78
December	21,600	7,380	13,300	2.21	2.55
January	25,200	3,580	11,800	1.96	2.26
February	34,900	5,920	11,900	1.98	2.06
March	48,900	9,300	22,600	3.76	4.34
April	33,660	8,910	13,400	2.23	2.49
May	30,000	2,860	8,800	1.46	1.68
June	7,760	1,260	2,970	.494	.55
July	7,010	1,470	2,490	.414	.48
August	5,920	970	1,960	.326	.38
September	10,100	970	3,690	.614	.68
The year	48,900	970	8,720	1.45	19.68

OHIO BASIN—STATION NO. 10

CLARION RIVER NEAR CLARION

Location.—At single-span steel highway bridge, known as Toby Bridge, about one mile north of Clarion, Clarion County.

Drainage Area.—930 square miles.

Records Available.—November 17, 1884, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by L. B. Gifford and B. O. Cyphert. Elevation of gage zero 1,052.00 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel, boulders and ledge. Control is at the first of a series of riffles about 800 feet below gage; permanent.

Extremes of Discharge.—Maximum stage during the year, 6.8 feet observed at 8 a. m. August 8 (discharge, 9,880 second-feet); minimum, —0.12 foot at 2 p. m. October 25 (discharge, 165 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 100 and 30,000 second-feet. Gage read to hundredths once daily at irregular times from October to July; at 8 a. m. during August and twice daily in September. Daily discharge ascertained by applying daily mean gage height, computed from a continuous daily hydrograph, obtained by plotting gage readings, to rating table. Results good except for estimated periods, when they are probably fair.

Discharge Measurements of Clarion River near Clarion, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
86	Oct. 1	O. W. Hartwell	2.13	1,220
87	May 12	J. M. Snavely	1.62	893
88	July 24	J. M. Snavely	.20	212

Daily Mean Gage Height, in feet, of Clarion River near Clarion, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.20	0.46	2.82	2.85	2.29	2.40	3.24	3.43	2.54	1.59	0.83	0.15
2	2.57	.56	2.80	3.29	2.07	2.38	3.32	2.64	2.22	.96	.58	.13
3	2.46	1.52	2.94	3.20	2.07	2.63	3.26	2.47	1.92	.58	.71	.12
4	1.98	1.40	2.78	2.70	1.95	3.87	3.01	2.58	1.71	.40	1.13	.14
5	1.33	1.04	2.68	2.51	1.90	3.44	2.67	2.68	1.48	.12	.88	.18
6	.70	.78	2.78	------	------	3.58	2.42	2.68	1.30	.08	.70	.19
7	.38	.58	2.68	------	------	4.08	2.26	2.44	1.26	.10	1.02	.22
8	.36	.46	2.44	------	------	4.22	2.28	2.22	1.08	.08	5.76	.40
9	.28	.57	2.40	------	------	4.89	2.42	2.02	.96	.16	3.65	.19
10	.26	.76	2.36	------	------	5.14	3.03	1.89	.88	.17	2.70	.22
11	.26	.72	2.00	------	------	4.80	3.22	1.78	.82	.18	2.10	1.23
12	.18	.90	1.74	------	------	4.44	3.16	1.74	.87	.20	1.68	2.57
13	.18	.74	2.18	------	------	4.03	2.98	1.84	.70	.76	1.68	1.72
14	.20	.70	2.78	------	------	3.82	2.79	1.57	.58	1.96	1.53	1.10
15	.14	.76	3.00	------	------	3.75	2.64	1.40	.52	1.43	1.19	1.01
16	.14	.80	3.02	------	------	3.72	2.68	1.32	.48	.80	1.07	.65
17	.10	1.20	2.90	------	------	3.80	2.50	1.12	.46	.70	.90	.66
18	.04	2.01	2.86	------	------	3.81	2.38	1.02	.52	.64	1.56	2.32
19	.00	1.75	2.56	------	------	3.33	2.32	1.02	.47	.42	2.58	2.01
20	−.02	1.56	2.20	------	------	3.20	2.20	1.00	.42	.32	1.72	1.55
21	−.02	2.08	1.75	------	------	3.32	2.08	.90	.32	.40	1.26	1.86
22	−.08	2.96	1.78	------	------	3.20	1.88	1.00	.26	.56	1.08	4.53
23	−.08	3.06	1.83	------	------	2.93	1.98	2.07	.17	.34	.86	3.70
24	−.10	3.18	2.13	------	------	2.85	2.31	2.38	.46	.18	.67	2.61
25	−.12	3.42	2.48	------	------	2.85	2.14	1.76	.24	.04	.60	2.32
26	−.02	3.57	2.16	------	1.74	2.90	1.96	1.46	.18	.02	.60	2.80
27	.10	3.26	2.06	------	2.18	2.88	1.86	1.43	.18	.00	.46	2.48
28	.50	3.38	2.18	------	2.45	2.83	2.00	1.38	.26	−.04	.30	2.05
29	.64	3.39	2.70	2.10	------	2.80	2.77	3.33	.60	.17	.30	1.80
30	.52	3.05	2.90	2.09	------	2.75	4.21	3.71	1.80	1.30	.20	1.74
31	.45	------	2.80	2.23	------	2.85	------	2.93	------	1.22	.20	------

NOTE—Stage-discharge relation Dec. 28 to Jan. 1 affected by ice. Gage height Jan. 6-28 unsatisfactory and Feb. 6-25 not observed. Gage height Aug. 1-31 furnished by the United States Weather Bureau.

Daily discharge, in second-feet, of Clarion River near Clarion, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,340	301	1,950	1,200	1,430	1,530	2,430	2,690	1,630	850	445	218
2	1,730	332	1,950	2,560	1,250	1,530	2,560	1,730	1,340	488	349	218
3	1,630	785	2,060	2,430	1,250	1,730	2,560	1,630	1,080	349	385	206
4	1,160	722	1,950	1,840	1,120	3,410	2,180	1,730	920	286	585	218
5	694	535	1,840	1,630	1,080	2,690	1,840	1,840	785	206	465	231
6	385	425	1,950	2,320	2,660	2,970	1,530	1,840	665	206	385	231
7	286	349	1,840			3,730	1,430	1,530	638	206	510	231
8	272	301	1,530			3,900	1,430	1,340	560	206	7,340	286
9	258	332	1,530			5,270	1,530	1,160	488	218	2,970	231
10	244	405	1,530			5,710	2,180	1,080	465	218	1,840	231
11	244	385	1,160			5,060	2,430	1,000	425	231	1,250	638
12	231	465	960			4,260	2,430	960	445	231	970	1,730
13	231	405	1,340			3,570	2,180	1,040	385	405	920	920
14	231	385	1,950			3,200	1,950	818	349	1,120	818	560
15	218	405	2,180			3,200	1,730	722	316	754	610	519
16	218	425	2,180			3,110	1,840	665	316	425	535	367
17	206	610	2,060			3,260	1,630	560	301	385	465	367
18	195	1,160	2,060			3,260	1,530	510	316	367	818	1,430
19	184	960	1,730			2,560	1,430	510	301	286	1,730	1,160
20	184	818	1,340			2,430	1,340	510	286	258	920	818
21	184	1,250	960			2,560	1,250	465	258	286	638	1,040
22	165	2,180	1,000			2,430	1,080	510	244	332	560	4,450
23	165	2,300	1,040			2,060	1,160	1,250	218	272	445	3,110
24	165	2,430	1,250			1,950	1,430	1,530	301	231	367	1,730
25	165	2,690	1,630			1,950	1,250	960	244	195	349	1,430
26	184	2,970	1,340		960	2,060	1,120	754	231	184	349	1,950
27	206	2,560	1,250		1,340	2,060	1,040	754	231	184	301	1,630
28	316	2,690	1,100		1,530	1,950	1,160	722	244	174	258	1,160
29	367	2,690	1,100	1,250	-------	1,950	1,950	2,560	349	218	258	1,000
30	316	2,180	1,200	1,259	-------	1,950	3,900	3,110	1,000	665	231	960
31	301	-------	1,000	1,340	-------	1,950	-------	2,060	-------	610	231	-------

NOTE—Discharge Dec. 28 to Jan. 1 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Mahoning Creek near Dayton. Discharge Jan. 6-28 estimated, because of unsatisfactory gage height record, and Feb. 6-25, because of no gage height record, from discharge of Mahoning Creek near Dayton. Braced figures show mean discharge for periods included.

Monthly discharge of Clarion River near Clarion, for the year ending Sept. 30, 1921

(Drainage area 930 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,730	165	409	0.440	0.51
November	2,970	301	1,150	1.24	1.38
December	2.180	960	1,550	1.67	1.92
January	7,000*	1,000*	2,160	2.32	2.68
February	4,000*	950*	2,260	2.43	2.53
March	5,710	1,530	2,880	3.10	3.57
April	3,900	1,040	1,780	1.91	2.13
May	3,110	465	1,240	1.33	1.53
June	1,630	218	511	.549	.61
July	1,120	174	356	.383	.44
August	7,340	231	911	.980	1.13
September	4,450	206	975	1.05	1.17
The year	7,340	165	1,340	1.44	19.60

* Discharge estimated.

OHIO BASIN—STATION NO. 11

RED BANK CREEK AT SAINT CHARLES

Location.—At single-span steel railroad bridge, Saint Charles, Clarion, County.

Drainage Area.—540 square miles.

Records Available.—October 19, 1909, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Forest S. Fish. Elevation of gage zero 976.24 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of rocks and fairly regular. Control is at the first of a series of riffles, where the bed is composed of large boulders and ledge, about 200 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 7.00 feet observed at 8 a. m. March 7 (discharge, 7,530 second-feet); minimum, 0.90 foot at 5 p. m. October 25 (discharge, 37 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 1,000 second-feet and fairly well defined between 1,000 and 10,000 second-feet. Gage read to quarter tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Red Bank Creek at Saint Charles, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
27	Mar. 15	J. M. Snavely	3.46	1,550
28	July 24*	H. J. McIntyre	1.48	153

* Measurement made by wading 500 feet below gage.

Daily Mean Gage Height, in feet, of Red Bank Creek at Saint Charles, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	1.41	3.32	2.31	2.62	3.01	2.71	2.68	2.88	1.80	2.34	1.22
2	-------	1.52	3.31	2.30	2.61	3.14	2.72	2.68	2.81	1.55	2.26	1.22
3	-------	1.51	3.40	2.31	2.48	3.21	2.82	2.65	2.78	1.45	2.44	1.18
4	-------	1.51	3.45	2.32	2.41	3.21	2.90	2.68	2.71	1.42	2.35	1.41
5	-------	1.55	3.50	2.42	2.40	3.65	2.82	2.72	2.71	1.25	2.26	1.80
6	-------	1.51	3.38	2.45	2.48	3.70	2.81	2.62	2.66	1.24	2.28	1.72
7	-------	1.45	3.28	2.51	2.51	6.66	2.70	2.71	2.40	1.20	2.78	1.64
8	-------	1.51	3.21	2.50	2.42	6.55	2.89	2.60	2.00	1.24	4.03	1.85
9	2.10	1.52	3.02	2.48	2.51	5.75	3.82	2.51	1.80	1.25	3.10	1.50
10	2.00	1.42	2.95	2.52	2.55	5.31	3.95	2.52	1.70	1.17	2.46	1.50
11	1.81	1.41	2.90	2.56	2.51	5.21	3.51	2.41	1.62	1.21	2.26	2.58
12	1.80	1.42	2.82	2.55	2.58	5.21	3.51	2.45	1.50	1.35	2.28	2.78
13	1.71	1.51	2.70	2.42	2.71	4.50	3.40	2.38	1.46	2.44	2.24	2.24
14	1.62	1.50	2.68	2.41	2.88	4.01	3.42	2.31	1.41	2.38	2.24	1.90
15	1.55	1.62	2.62	2.44	3.02	3.56	3.38	2.31	1.40	2.10	2.36	1.60
16	1.54	1.58	2.60	2.48	3.12	3.42	3.36	2.25	1.40	1.82	2.28	1.62
17	1.51	2.24	2.62	2.41	3.42	3.31	3.05	2.18	1.49	1.58	2.32	2.29
18	1.50	3.08	2.72	2.50	3.41	3.20	2.65	2.00	1.46	1.52	2.32	4.88
19	1.40	3.20	2.75	2.58	3.35	3.15	2.51	1.96	1.42	1.58	2.22	3.86
20	1.31	3.26	2.81	2.78	3.08	3.28	2.40	1.75	1.40	1.78	2.02	3.35
21	1.21	3.15	2.80	2.88	-------	3.21	2.35	1.40	1.44	1.95	1.88	3.85
22	1.22	4.02	2.80	3.00	-------	3.25	2.21	1.20	1.28	1.88	1.66	5.96
23	1.11	4.01	2.68	3.11	-------	3.20	2.30	1.26	1.20	1.75	1.44	4.68
24	1.11	3.85	2.70	3.22	-------	3.20	2.29	1.31	1.28	1.52	1.52	4.05
25	.95	3.81	2.61	3.20	-------	3.20	2.31	1.30	1.25	1.22	1.45	3.70
26	1.02	3.72	2.50	3.05	-------	3.22	2.28	1.30	1.25	1.16	1.36	3.20
27	1.15	3.71	2.41	2.98	3.00	2.90	2.21	1.58	1.25	1.22	1.32	2.80
28	1.21	3.65	2.35	2.75	3.05	2.62	2.35	2.13	1.28	1.36	1.31	2.55
29	1.24	3.62	2.41	2.72	-------	2.71	2.52	3.88	1.30	1.76	1.25	2.35
30	1.26	3.55	2.42	2.70	-------	2.71	2.62	3.59	2.00	2.48	1.22	2.25
31	1.31	-------	2.45	2.66	-------	2.68	-------	3.10	-------	2.50	1.23	-------

NOTE—Gage height Oct. 1-8 and Feb. 21-26 unsatisfactory.

Daily discharge, in second-feet, of Red Bank Creek at Saint Charles, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,600	148	1,230	520	696	970	760	760	895	280	548	100
2	1,700	175	1,230	520	696	1,050	760	760	826	191	493	100
3	1,200	175	1,330	520	635	1,140	826	728	826	160	606	90
4	850	175	1,330	520	576	1,140	895	760	760	151	548	148
5	700	191	1,440	576	576	1,550	826	760	760	108	493	280
6	550	175	1,330	606	635	1,670	826	696	728	105	520	242
7	500	160	1,230	635	635	6,900	760	769	576	95	826	224
8	480	175	1,140	635	576	6,690	895	696	368	105	2,050	301
9	416	175	970	635	635	5,050	1,790	625	280	108	1,050	175
10	368	151	932	635	666	4,110	2,050	635	242	88	606	175
11	280	148	895	666	635	3,930	1,440	576	207	98	493	696
12	280	151	826	666	696	3,930	1,440	606	175	132	520	826
13	242	175	760	576	760	2,780	1,330	576	163	606	493	493
14	207	175	760	576	895	2,050	1,330	520	148	576	493	322
15	191	207	696	606	970	1,550	1,330	520	145	416	548	207
16	191	207	696	635	1,050	1,330	1,320	493	145	280	520	207
17	175	493	696	576	1,330	1,230	970	466	172	207	520	520
18	175	1,050	760	635	1,330	1,140	728	368	163	175	520	3,410
19	145	1,140	793	696	1,330	1,140	635	345	151	207	466	1,920
20	122	1,230	826	826	1,050	1,230	576	261	145	280	368	1,330
21	98	1,140	826	895	1,040	1,140	548	145	157	345	322	1,790
22	100	2,050	826	970	1,030	1,140	466	95	115	322	224	5,450
23	74	2,050	760	1,050	1,020	1,140	520	110	95	191	157	3,090
24	74	1,790	760	1,140	1,000	1,140	520	122	115	175	175	2,050
25	44	1,790	696	1,140	990	1,140	520	120	108	100	160	1,670
26	56	1,670	635	970	980	1,140	520	120	108	86	135	1,140
27	84	1,679	576	970	970	895	466	207	108	100	125	826
28	98	1,550	548	793	970	696	548	441	115	135	122	666
29	105	1,550	576	760	-------	760	635	1,920	120	261	108	548
30	110	1,550	576	760	-------	760	696	1,550	368	635	100	493
31	122	-------	606	728	-------	760	-------	1,050	-------	635	102	-------

NOTE—Discharge Oct. 1-8 and Feb. 21-26 estimated, because of unsatisfactory gage height record, from study of gage height graph and discharge of Mahoning Creek near Dayton.

Monthly discharge of Red Bank Creek at Saint Charles, for the year ending Sept. 30, 1921

(Drainage area 540 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	2,600	44	398	0.737	0.85
November	2,050	148	783	1.45	1.62
December	1,440	548	879	1.63	1.88
January	1,140	520	724	1.34	1.54
February	1,330	576	870	1.61	1.68
March	6,900	696	1,980	3.67	4.23
April	2,050	466	898	1.66	1.85
May	1,920	95	574	1.06	1.22
June	895	95	309	.572	.64
July	635	86	237	.439	.51
August	2,050	100	465	.861	.99
September	5,450	90	983	1.82	2.03
The year	6,900	44	757	1.40	19.04

OHIO BASIN—STATION NO. 12

MAHONING CREEK NEAR DAYTON

Location.—At single-span steel highway bridge, known as Independence Bridge, about three miles northwest of Dayton, Armstrong County.

Drainage Area.—322 square miles.

Records Available.—August 12, 1916, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by J. T. Mathews.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and boulders. Control for low stages is at the first of a series of riffles about 50 feet below gage; practically permanent; for high stages a dam about one mile below the station.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 7.0 feet at 4 a. m. September 22, (discharge, about 5,320 second-feet); minimum, 1.6 feet from 8 a. m. July 25 to 8 a. m. July 27 (discharge, 20 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined between 40 and 1,500 second-feet. Gage read to tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for extreme stages when they are fair.

Discharge Measurements of Mahoning Creek near Dayton, during the year ending Sept. 30, 1921

No.	Date	Made by--	Gage height	Discharge
			Feet	Sec.-ft.
11	Mar. 14	J. M. Snavely	3.91	1,460
12	16	J. M. Snavely	3.92	1,490
13	July 22*	J. M. Snavely	1.76	38.5

* Measurement made by wading 300 feet above gage.

Daily Mean Gage Height, in feet, of Mahoning Creek near Dayton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.15	2.0	3.05	2.75	3.0	3.25	2.9	2.7	2.2	2.1	2.05	1.8
2	3.6	2.45	3.4	3.05	2.8	3.5	2.9	2.6	2.1	2.1	1.9	1.85
3	3.2	3.4	3.65	3.0	2.7	4.35	2.85	2.6	2.1	2.0	2.3	1.85
4	2.9	2.8	3.4	2.8	2.7	4.05	2.75	2.7	2.1	1.8	2.4	1.95
5	2.75	2.5	3.3	2.8	3.0	4.05	2.7	3.3	2.0	1.75	2.15	2.2
6	2.6	2.4	3.2	2.8	4.0	4.75	2.6	3.55	1.9	1.7	2.25	2.05
7	2.6	2.35	3.0	2.85	3.65	5.45	2.6	3.25	1.9	1.7	4.05	1.9
8	2.5	2.3	2.9	3.9	3.7	5.6	2.6	3.05	1.9	1.7	4.55	1.8
9	2.3	2.3	2.75	3.8	3.85	4.75	2.8	2.9	1.9	1.8	3.3	1.8
10	2.3	2.35	2.7	3.5	4.05	4.15	2.9	2.75	1.9	1.7	2.8	1.8
11	2.15	2.25	2.7	3.25	3.9	4.25	2.8	2.65	1.8	1.7	2.6	1.85
12	2.1	2.2	2.65	3.0	3.7	3.85	2.7	2.6	1.95	1.9	2.4	2.3
13	2.1	2.15	2.55	2.8	3.5	4.45	2.55	2.5	2.0	2.2	2.35	2.05
14	2.0	2.0	3.2	2.85	3.5	4.0	2.55	2.45	1.9	1.95	2.25	1.85
15	2.0	2.2	3.95	2.75	3.4	3.7	2.55	2.4	1.8	1.8	2.4	1.8
16	2.0	2.3	3.55	2.75	3.5	3.9	2.5	2.3	1.8	1.8	2.25	1.8
17	2.0	2.8	3.35	3.35	3.85	4.0	2.5	2.2	1.7	1.8	2.1	2.05
18	2.0	3.1	3.1	4.0	3.55	3.75	2.5	2.2	1.8	1.7	2.35	3.2
19	2.0	2.95	3.05	4.0	3.3	3.4	2.4	2.2	1.75	1.7	2.35	2.6
20	2.0	3.45	2.75	4.2	3.15	3.3	2.3	2.1	1.75	1.85	2.15	2.3
21	1.9	4.4	4.15	4.5	2.95	3.15	2.3	2.1	1.7	1.85	2.1	3.65
22	1.9	4.35	4.45	5.0	3.05	3.1	2.3	2.0	1.7	1.8	2.05	6.0
23	1.9	4.1	3.8	4.9	2.9	2.95	2.35	2.0	1.8	1.7	2.0	4.1
24	1.9	4.1	3.5	4.1	2.8	2.8	2.5	2.1	1.8	1.7	1.9	3.3
25	1.9	4.15	3.1	3.55	2.6	2.9	2.35	2.15	1.75	1.6	1.9	3.0
26	1.9	3.85	2.95	3.1	2.6	2.75	2.2	2.25	1.7	1.6	1.9	2.95
27	2.05	3.5	3.1	2.95	2.9	2.7	2.2	2.1	1.85	1.95	1.8	2.7
28	2.45	3.35	2.9	2.9	3.35	2.7	2.35	2.15	2.05	2.2	1.8	2.65
29	2.2	3.2	2.8	2.85	-------	3.0	2.65	2.6	2.1	2.45	1.8	2.5
30	2.1	3.0	3.1	2.95	-------	2.75	2.8	2.6	2.35	2.7	1.8	2.35
31	2.1	-------	2.65	3.3	-------	2.75	-------	2.35	-------	2.2	1.8	-------

NOTE.—Stage-discharge relation Dec. 21, 22, Jan. 17-21 and Feb. 26 affected by ice.

Daily discharge, in second-feet, of Mahoning Creek near Dayton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,590	90	595	413	560	738	500	385	150	120	105	50
2	1,020	255	850	595	440	935	500	330	120	120	70	60
3	700	850	1,060	560	385	1,790	470	330	120	90	190	60
4	500	440	850	440	385	1,390	413	385	120	50	230	80
5	413	280	775	440	560	1,390	385	775	90	42	135	150
6	330	230	700	440	1,390	2,220	330	977	70	35	170	105
7	330	210	560	470	1,060	2,950	330	738	70	35	1,390	70
8	280	190	500	1,300	1,110	3,230	330	595	70	35	2,000	50
9	190	190	413	1,200	1,250	2,220	440	500	70	50	775	50
10	190	210	385	935	1,390	1,590	500	413	70	35	440	50
11	135	170	385	738	1,300	1,590	440	358	50	35	330	60
12	120	150	358	560	1,110	1,250	385	330	80	70	230	190
13	120	135	305	440	935	1,790	305	280	90	150	210	105
14	90	90	700	470	935	1,390	305	255	70	80	170	60
15	90	150	1,340	413	850	1,110	305	230	50	50	230	50
16	90	190	977	413	935	1,300	280	190	50	50	170	50
17	90	440	813	360	1,250	1,390	280	150	35	50	120	105
18	90	630	630	300	977	1,160	280	150	50	35	210	700
19	90	530	595	280	775	850	230	150	42	35	210	330
20	90	892	413	440	665	775	190	120	42	60	135	190
21	70	1,790	340	1,300	530	665	190	120	35	60	120	1,060
22	70	1,790	380	2,450	595	630	190	90	35	50	105	3,790
23	70	1,490	1,200	2,330	500	530	210	90	50	35	90	1,490
24	70	1,490	935	1,490	440	440	280	120	50	35	70	775
25	70	1,590	630	977	330	500	210	135	42	20	70	560
26	70	1,250	530	630	330	413	150	170	35	20	70	530
27	105	935	630	530	500	385	150	120	60	80	50	385
28	255	813	500	500	813	385	210	135	105	150	50	358
29	150	700	440	470	-------	560	358	330	120	255	50	280
30	120	560	630	530	-------	413	440	330	210	385	50	210
31	120	-------	358	775	-------	413	-------	210	-------	150	50	-------

NOTE.—Discharge Dec. 21, 22, Jan. 17-21 and Feb. 26 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Crooked Creek at Hileman's Farm.

Monthly discharge of Mahoning Creek near Dayton, for the year ending Sept. 30, 1921

(Drainage area 322 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,590	70	249	0.773	0.89
November	1,790	90	624	0.94	2.16
December	1,340	305	638	1.98	2.28
January	2,450	280	748	2.32	2.68
February	1,390	330	796	2.47	2.57
March	3,230	385	1,170	3.63	4.18
April	500	150	320	.994	1.11
May	977	90	306	.950	1.10
June	210	35	75.0	.233	.26
July	385	20	79.6	.247	.28
August	2,000	50	268	.832	.96
September	3,790	50	400	1.24	1.38
The year	3,790	20	472	1.47	19.85

OHIO BASIN—STATION NO. 13

ALLEGHENY RIVER AT KITTANNING

Location.—At five-span steel highway bridge, Market Street, Kittanning, Armstrong County.

Drainage Area.—9,010 square miles.

Records Available.—August 18, 1904, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by S. C. Carr. Elevation of gage zero 764.45 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel. Control is at a riffle about 500 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 15.2 feet observed at 5 p. m. March 8 (discharge, 79,700 second-feet); minimum, 1.6 feet from 5 p. m. September 1 to 5 p. m. September 2 (discharge, 1,100 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined between 800 and 250,000 second-feet. Gage read to tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge measurements of Allegheny River at Kittanning, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
54	May 11	J. M. Snavely	5.08	9,420
55	July 23	H. J. McIntyre	3.48	4,610

Daily Mean Gage Height, in feet, of Allegheny River at Kittanning, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.15	3.1	6.4	5.5	6.1	6.2	8.85	10.65	5.8	4.4	3.05	1.65
2	5.2	3.5	6.45	5.8	5.6	6.45	9.2	9.75	5.3	4.65	2.8	1.6
3	5.1	3.8	7.8	8.3	5.4	7.7	8.65	8.7	4.8	4.1	2.85	1.7
4	5.0	4.1	8.55	9.2	5.0	9.5	8.0	7.85	4.4	3.45	3.05	1.8
5	4.7	4.3	8.2	8.5	5.05	9.5	7.25	7.35	4.1	2.95	3.0	2.4
6	4.2	4.3	8.2	7.7	6.05	9.55	6.8	7.2	3.85	2.65	2.85	2.9
7	3.7	4.0	8.5	7.35	6.8	12.05	6.3	6.7	3.55	2.4	2.9	2.6
8	3.3	3.7	8.05	7.45	7.25	14.85	6.0	6.2	3.35	2.3	5.55	2.3
9	3.05	3.4	7.35	8.3	7.55	13.55	6.1	5.8	3.2	2.35	6.25	2.6
10	2.8	3.3	6.65	8.1	7.7	13.2	6.8	5.45	3.1	2.55	4.75	2.25
11	2.65	3.3	6.25	7.2	7.8	12.35	7.2	5.15	3.0	2.75	3.9	2.5
12	2.55	3.45	5.8	6.7	7.5	11.15	7.1	4.85	2.9	2.8	3.7	3.4
13	2.45	3.8	5.55	6.2	6.85	10.45	6.6	4.6	2.8	2.8	3.65	3.45
14	2.4	3.8	5.8	5.8	6.45	10.5	6.2	4.55	3.2	3.0	3.4	3.2
15	2.4	3.35	7.7	5.7	6.25	9.7	6.0	4.4	3.2	3.55	3.25	2.8
16	2.3	3.2	9.2	5.45	6.2	9.1	6.0	4.35	2.95	3.45	3.05	2.6
17	2.3	3.45	8.55	5.0	7.0	9.1	6.0	4.1	2.75	3.1	2.85	2.5
18	2.2	4.2	7.65	4.5	10.5	8.55	6.2	3.95	2.55	2.75	2.8	5.75
19	2.2	4.6	6.9	3.7	10.6	8.15	7.45	3.77	2.5	2.6	3.15	6.0
20	2.1	5.1	6.0	3.5	9.2	7.8	7.6	3.6	2.4	2.6	3.6	6.15
21	2.0	6.1	5.4	3.8	8.1	7.7	6.85	3.45	2.35	2.65	3.1	7.2
22	2.0	6.95	5.45	5.45	7.0	8.3	6.2	3.4	2.3	2.6	2.95	8.0
23	1.95	9.3	6.35	9.6	6.5	8.3	5.8	3.2	2.2	3.4	2.75	7.45
24	1.9	10.85	7.35	10.0	6.2	7.75	5.85	3.2	2.3	3.0	2.5	6.6
25	1.9	10.6	7.9	8.75	5.8	7.3	6.15	4.6	2.2	2.7	2.4	5.65
26	1.9	9.95	7.2	7.3	5.6	7.3	6.3	5.05	2.2	2.35	2.2	5.15
27	1.95	9.1	6.4	5.95	5.2	7.1	5.9	4.75	2.1	2.3	2.1	5.2
28	2.15	8.4	6.4	5.55	5.75	7.05	5.7	4.55	2.0	2.2	2.0	4.95
29	2.35	7.65	5.75	5.4	-------	8.55	6.2	5.95	2.05	2.4	1.85	4.5
30	2.5	6.9	4.95	5.55	-------	9.65	9.35	7.05	2.6	3.5	1.8	4.2
31	2.7	-------	5.1	6.05	-------	9.15	-------	6.6	-------	3.5	1.75	-------

Daily discharge, in second-feet, of Allegheny River at Kittanning, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,380	3,720	15,800	11,400	14,300	14,800	30,400	42,900	12,800	6,960	3,490	1,160
2	10,100	4,620	15,800	12,800	11,900	15,800	33,000	37,200	10,500	7,600	3,060	1,100
3	9,640	5,340	23,900	27,100	11,000	23,300	29,000	29,700	8,380	6,100	3,060	1,220
4	9,200	6,100	29,000	33,000	9,200	35,100	25,260	23,900	6,960	4,390	3,490	1,340
5	7,980	6,660	26,406	28,400	9,200	35,100	20,200	21,400	6,100	3,490	3,490	2,260
6	6,380	6,660	26,400	23,300	13,800	35,800	17,800	20,200	5,340	2,640	3,060	3,270
7	5,080	5,840	28,400	21,400	17,800	53,000	15,300	17,300	4,850	2,260	3,270	2,640
8	4,160	5,680	25,200	21,400	20,200	76,200	13,800	14,800	4,390	2,080	11,900	2,080
9	3,490	4,390	21,400	27,100	21,400	65,700	14,300	12,800	3,940	2,160	14,800	2,640
10	3,060	4,160	16,800	25,800	23,300	62,400	17,800	11,000	3,720	2,640	8,380	2,000
11	2,640	4,160	14,800	20,200	23,900	56,100	20,200	10,100	3,490	3,060	5,580	2,440
12	2,640	4,390	12,800	17,300	22,000	47,100	19,600	8,380	3,270	3,060	5,080	4,390
13	2,350	5,340	11,900	14,800	17,800	41,400	16,800	7,600	3,060	3,060	4,850	4,390
14	2,260	5,340	12,800	12,800	15,800	42,200	14,800	7,600	3,940	3,490	4,390	3,940
15	2,260	4,390	23,300	12,400	14,800	36,500	13,800	6,960	3,940	4,850	3,940	3,060
16	2,080	3,940	33,000	11,000	14,800	32,400	13,800	6,960	3,490	4,390	3,490	2,640
17	2,080	4,390	29,000	9,200	19,000	32,400	13,800	6,100	3,060	3,720	3,060	2,440
18	1,920	6,380	22,600	7,260	42,200	29,000	14,800	5,840	2,640	3,060	3,060	12,800
19	1,920	7,600	18,400	5,080	42,900	26,400	21,400	5,340	2,440	2,640	3,940	13,800
20	1,760	9,640	13,800	4,620	33,000	23,900	22,600	4,850	2,260	2,640	4,850	14,800
21	1,600	14,300	11,000	5,340	25,800	23,300	17,800	4,390	2,160	2,640	3,720	20,200
22	1,600	19,000	11,000	11,000	19,600	27,100	14,800	4,390	2,080	2,640	3,490	25,200
23	1,530	33,700	15,800	35,800	16,200	27,100	12,800	3,940	1,920	4,390	3,060	21,400
24	1,460	44,300	21,400	38,600	14,800	23,900	12,800	3,940	2,080	3,490	2,440	16,800
25	1,460	42,900	24,500	30,400	12,800	20,800	14,800	7,600	1,920	2,850	2,260	11,900
26	1,460	38,600	20,200	20,800	11,900	20,800	15,300	9,200	1,920	2,160	1,920	10,100
27	1,530	32,400	15,800	13,800	10,100	19,600	13,300	8,380	1,760	2,080	1,760	10,100
28	1,840	27,800	15,800	11,900	12,800	19,000	12,400	7,600	1,600	1,920	1,600	9,200
29	2,160	22,600	12,800	11,000	-------	29,000	14,800	13,800	1,680	2,260	1,400	7,260
30	2,440	18,400	9,200	11,900	-------	35,800	34,400	19,000	2,640	4,620	1,340	6,380
31	2,850	-------	9,640	13,800	-------	33,000	-------	16,800	-------	4,620	1,280	-------

Monthly discharge of Allegheny River at Kittanning, for the year ending Sept. 30, 1921

(**Drainage** area 9,010 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	10,100	1,460	3,460	0.384	0.44
November	44,300	3,720	13,400	1.49	1.66
December	33,000	9,200	19,000	2.11	2.43
January	38,600	4,620	17,800	1.98	2.28
February	42,900	9,200	18,600	2.06	2.14
March	76,200	14,800	34,300	3.81	4.39
April	34,400	12,400	18,400	2.04	2.28
May	42,900	3,940	12,900	1.43	1.65
June	12,800	1,600	3,940	.437	.49
July	7,600	1,920	3,480	.386	.44
August	14,800	1,280	4,020	.446	.51
September	25,200	1,100	7,430	.825	.92
The year	76,200	1,100	13,000	1.44	19.63

OHIO BASIN—STATION NO. 14

CROOKED CREEK AT HILEMAN'S FARM

Location.—At single-span steel highway bridge, about three and one-half miles south of Ford City, at Hileman's Farm, Armstrong County.

Drainage Area.—279 square miles.

Records Available.—October 16, 1909, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by D. G. Hileman.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Left bank is high and not subject to overflow; right is low and begins to overflow at a stage of about 8 feet. Bed is composed of gravel and rock. Control is at a riffle about 300 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 9.5 feet at midnight September 21-22 (discharge, about 9,400 second-feet); minimum, 0.80 foot from 6 p. m. June 20 to 7.30 a. m. September 21 (discharge, 51 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 500 second-feet and fairly well defined between 500 and 5,500 second-feet. Gage read to hundredths twice daily previous to December 6; tenths twice daily from that date. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge measurements of Crooked Creek at Hileman's Farm, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
27	Mar. 18	J. M. Snavely	2.92	580
28	May 11	J. M. Snavely	2.10	256
29	July 23*	H. J. McIntyre	1.10	16.4

* Measurement made by wading 250 feet above gage.

Daily Mean Gage Height, in feet, of Crooked Creek at Hileman's Farm, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.24	1.43	2.61	2.15	3.15	3.55	2.7	3.05	1.75	1.3	1.75	1.15
2	3.17	1.65	3.28	2.6	2.9	4.05	2.4	3.15	1.65	1.15	1.5	1.1
3	2.71	3.08	3.69	2.65	2.75	4.15	2.5	3.35	1.6	1.3	1.55	1.1
4	2.56	2.85	3.55	2.45	2.55	3.75	2.6	3.5	1.3	1.3	1.75	1.55
5	2.42	2.51	3.09	2.35	3.0	3.9	2.45	3.85	1.4	1.25	1.55	3.95
6	2.31	2.17	2.9	2.4	4.35	3.75	2.3	3.75	1.4	1.2	1.45	2.95
7	2.03	1.84	2.7	2.6	3.95	5.25	2.15	3.4	1.4	1.15	2.45	2.4
8	1.75	1.99	2.65	4.0	3.35	5.65	2.1	3.0	1.3	1.25	4.0	2.0
9	1.69	1.85	2.3	3.9	3.95	5.0	2.65	2.75	1.3	1.3	2.7	1.75
10	1.65	1.91	2.35	3.45	3.75	4.4	2.65	2.4	1.35	1.2	2.2	1.75
11	1.59	1.85	2.35	3.05	4.45	3.7	2.55	2.3	1.3	1.35	1.95	1.9
12	1.56	1.81	2.3	2.75	4.8	3.3	2.4	2.05	1.2	1.7	1.85	2.3
13	1.52	1.73	2.25	2.65	4.0	3.25	2.2	1.8	1.2	1.8	1.95	1.85
14	1.49	1.51	2.3	2.8	3.75	3.25	2.05	1.6	1.15	1.5	1.7	1.65
15	1.44	1.43	2.75	3.0	3.6	3.05	2.25	1.5	1.1	1.25	2.15	1.55
16	1.41	1.59	3.0	2.85	2.5	2.7	2.25	1.4	1.1	1.2	1.9	1.5
17	1.36	2.40	2.85	2.35	2.9	2.65	2.2	1.4	1.15	1.1	1.65	1.45
18	1.32	3.05	2.65	2.05	2.65	3.05	2.1	1.3	1.0	1.1	1.65	2.2
19	1.31	2.87	2.37	2.1	2.3	2.75	2.0	1.15	1.0	1.2	1.7	2.4
20	1.30	3.15	2.3	2.05	2.55	2.65	2.0	1.1	.9	1.2	1.6	2.0
21	1.29	4.30	1.95	2.8	2.45	2.55	1.8	1.05	.95	1.0	1.45	4.85
22	1.29	4.05	2.0	4.9	2.55	2.45	1.95	1.0	1.35	1.0	1.4	7.25
23	1.28	3.61	3.15	5.6	2.4	2.35	1.9	1.4	1.55	1.0	1.3	3.95
24	1.28	3.18	3.05	4.35	2.35	2.25	1.8	2.8	1.4	1.1	1.3	3.05
25	1.27	3.11	2.85	3.4	2.05	2.1	1.75	2.8	1.25	1.1	1.2	2.7
26	1.25	3.11	2.7	2.55	2.3	1.85	1.7	2.5	1.25	1.0	1.6	2.6
27	1.48	2.91	2.8	2.35	2.45	2.15	2.1	1.75	1.3	1.0	1.7	2.25
28	1.89	2.78	2.65	2.5	3.0	2.25	2.4	1.6	1.35	1.0	1.45	2.15
29	1.84	2.67	2.3	2.4	------	2.5	2.7	2.7	1.45	1.25	1.35	2.0
30	1.79	2.50	2.3	2.55	------	2.35	3.1	2.35	1.45	2.2	1.3	1.9
31	1.71	------	2.3	3.2	------	2.9	------	1.9	------	1.9	1.2	------

Daily discharge, in second-feet, of Crooked Creek at Hileman's Farm, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	890	38	450	205	815	1,170	510	745	85	27	85	18
2	815	67	930	450	640	1,520	330	815	67	18	46	15
3	510	780	1,250	480	540	1,700	390	970	59	27	52	15
4	420	605	1,170	360	420	1,340	450	1,090	27	27	85	52
5	342	390	780	302	710	1,430	360	1,340	35	24	52	1,520
6	280	213	640	330	1,890	1,340	275	1,340	35	20	40	675
7	160	105	510	450	1,520	2,730	205	1,010	35	18	360	330
8	85	147	480	1,520	970	3,190	185	710	27	24	1,520	150
9	73	108	275	1,430	1,520	2,510	480	540	27	27	510	85
10	67	123	302	1,050	1,340	1,890	480	330	31	20	225	35
11	58	108	302	745	1,890	1,250	420	275	27	31	135	120
12	54	98	275	540	2,290	930	330	168	20	75	108	275
13	49	81	250	480	1,520	890	225	95	20	95	135	108
14	45	47	275	570	1,340	890	168	59	18	46	75	67
15	39	38	540	710	1,170	745	250	46	15	31	205	52
16	36	58	710	605	1,090	510	250	35	15	20	120	46
17	32	330	605	302	640	480	225	35	18	15	67	40
18	29	745	180	168	480	745	185	27	11	15	67	225
19	28	605	311	185	275	540	150	18	11	20	75	360
20	27	815	275	168	420	480	150	15	7.6	20	59	150
21	26	1,790	135	570	360	420	95	13	9.2	11	40	2,290
22	26	1,520	150	2,400	420	360	135	11	31	11	35	5,400
23	26	1,170	815	3,190	330	302	120	35	52	11	27	1,520
24	26	850	745	1,890	302	250	95	570	35	15	27	745
25	25	780	605	1,010	168	185	85	570	24	15	20	510
26	24	780	510	420	275	108	75	390	24	11	59	450
27	44	640	570	302	360	205	185	85	27	11	75	250
28	118	570	480	390	710	250	330	59	31	11	40	205
29	105	480	275	330	-------	390	510	510	40	14	31	150
30	93	390	275	420	-------	302	780	302	40	225	27	120
31	77	-------	275	850	-------	640	-------	120	-------	120	20	-------

Monthly discharge of Crooked Creek at Hileman's Farm, for the year ending Sept. 30, 1921

(Drainage area 279 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	890	24	149	0.534	0.62
November	1,790	38	482	1.73	1.93
December	1,250	135	505	1.81	2.09
January	3,190	168	736	2.64	3.04
February	2,290	168	872	3.13	3.26
March	3,190	108	958	3.43	3.95
April	780	75	281	1.01	1.13
May	1,340	11	398	1.43	1.65
June	85	7.6	30.1	.108	.12
July	225	11	34.4	.123	.14
August	1,520	20	143	.513	.59
September	5,400	15	533	1.91	2.13
The year	5,400	7.6	424	1.52	20.65

STONY CREEK AT JOHNSTOWN

Location.—At single-span steel highway bridge, Poplar Street, Johnstown, Cambria County, about one and one-half miles above the confluence of Stony Creek and the Little Conemaugh River.

Drainage Area.—468 square miles.

Records Available.—July 2, 1913, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Herbert F. Reitz. Elevation of gage zero 1,154.0 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Banks are high and not subject to overflow. Control for low water is at a riffle, where the bed is composed of gravel and small boulders, about 100 feet below gage; practically permanent. Control for high stages is at a riffle, where the bed is composed of gravel and large boulders, about 1,300 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 8.98 feet observed at 5 p. m. March 3 (discharge, 7,670 second-feet); minimum, 1.08 feet from 6 p. m. June 16 to 7 a. m. June 17 (discharge 58 second-feet).

Ice.—Stage-discharge relation usually affected by ice for short periods.

Diversions.—A dam one mile above the mouth of Quemahoning Creek creates a reservoir having a capacity of 1,740,000,000 cubic feet, from which water is carried through a conduit to the plant of the Cambria Steel Company at Johnstown, where it is returned to the stream below the gaging station.

Accuracy.—Stage-discharge relation probably permanent throughout the year. Rating curve fairly well defined below 1,000 second-feet and well defined from 1,000 to 8,000 second-feet. Gage read to quarter tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Cooperation.—A record of the quantity of water diverted from the Quemahoning Reservoir is furnished by the Cambria Steel Company, Johnstown.

The following discharge measurement was made by J. M. Snavely: No. 45, July 13: Gage height 1.60 feet; discharge, 232 second-feet.

Daily Mean Gage Height, in feet, of Stony Creek at Johnstown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.15	1.26	2.85	2.43	4.90	2.68	1.73	-------	2.40	1.77	1.22	1.10
2	2.82	1.57	4.35	2.83	4.75	3.27	1.63	-------	2.06	1.66	1.91	1.12
3	2.25	2.12	3.86	2.76	3.06	7.61	1.58	-------	1.78	1.50	3.92	1.24
4	1.94	1.90	3.48	2.53	3.08	6.83	1.58	-------	1.73	1.30	3.08	1.50
5	1.82	1.76	3.20	2.40	3.78	5.90	1.53	-------	1.60	1.18	2.25	2.20
6	1.72	1.60	2.90	2.34	5.10	5.76	1.50	-------	1.46	1.27	1.74	2.10
7	1.64	1.43	2.66	3.32	4.63	5.50	1.48	-------	1.43	1.20	2.05	1.80
8	1.52	1.24	2.56	6.76	3.65	4.83	1.48	-------	1.37	1.19	2.38	1.52
9	1.42	1.19	2.36	5.58	3.86	5.16	1.50	-------	1.36	1.18	1.92	3.39
10	1.32	1.18	2.26	4.80	3.85	4.86	2.28	-------	1.30	1.18	1.60	3.80
11	1.22	1.11	2.20	4.04	4.29	4.43	2.36	-------	1.28	1.48	1.48	3.48
12	1.18	1.18	2.03	3.40	3.73	4.10	2.08	-------	1.28	2.02	1.42	3.10
13	1.20	1.18	2.10	2.83	3.42	3.50	1.70	-------	1.28	1.59	1.52	2.52
14	1.15	1.24	3.69	2.67	3.33	3.60	1.66	-------	1.23	1.35	1.45	2.02
15	1.18	1.23	3.78	2.50	3.33	3.70	1.56	-------	1.16	1.46	1.42	1.62
16	1.26	1.27	3.28	2.73	3.33	3.63	1.48	-------	1.10	1.92	1.32	1.55
17	1.22	1.28	2.88	2.58	3.46	3.80	1.43	-------	1.23	1.68	1.72	1.68
18	1.20	1.40	2.66	2.39	3.13	4.10	1.40	-------	1.71	1.42	2.97	2.38
19	1.15	1.53	2.48	2.28	2.90	3.60	1.30	-------	1.41	1.52	2.16	1.85
20	1.18	1.83	2.38	2.26	2.88	3.33	1.26	-------	1.30	2.05	1.70	1.60
21	1.20	2.86	2.30	2.43	2.73	3.16	1.18	-------	1.27	1.55	1.49	3.39
22	1.19	3.38	2.43	4.13	2.56	3.00	1.26	1.78	1.20	1.35	1.38	5.02
23	1.17	3.76	3.23	7.44	2.44	2.83	1.33	1.67	1.13	1.23	1.34	3.90
24	1.18	4.18	3.18	5.58	2.32	2.66	1.38	1.56	1.23	1.18	1.29	2.75
25	1.17	4.08	3.00	4.25	2.33	2.50	1.48	2.17	1.17	1.15	1.18	2.61
26	1.18	3.80	2.60	3.26	2.23	2.30	1.70	2.58	1.91	1.72	1.15	3.22
27	1.19	3.63	2.36	2.87	2.16	2.20	1.76	2.67	1.93	1.50	1.15	2.49
28	1.18	2.98	2.26	2.78	2.90	2.10	1.90	2.20	1.58	1.25	1.12	2.22
29	1.18	2.70	2.28	2.76	-------	1.93	2.18	2.73	1.52	1.30	1.10	1.86
30	1.26	2.35	2.38	3.19	-------	1.86	2.08	3.92	2.54	1.32	1.10	1.76
31	1.27	-------	2.38	4.79	-------	1.78	-------	3.22	-------	1.26	1.12	-------

NOTE—Gage height May 1-21 unsatisfactory.

Daily discharge, in second-feet, of Stony Creek at Johnstown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,000	105	750	572	2,370	695	271	380	550	271	93	62
2	750	200	1,920	750	2,280	1,070	234	420	392	234	330	67
3	482	415	1,520	750	935	5,510	217	500	290	182	1,520	99
4	350	330	1,210	595	935	4,460	217	1,200	271	117	935	182
5	290	271	1,000	550	1,440	3,380	200	4,400	217	82	482	505
6	252	217	810	528	2,560	3,270	182	2,600	168	108	271	415
7	234	158	695	1,070	2,100	2,960	175	1,700	158	87	392	290
8	182	99	645	4,460	1,280	2,280	175	1,300	138	84	550	182
9	154	84	528	3,060	1,520	2,660	182	1,000	135	82	330	1,140
10	123	82	482	2,280	1,440	2,370	505	850	117	82	217	1,520
11	93	72	460	1,600	1,840	1,920	528	850	111	175	175	1,210
12	82	82	392	1,140	1,360	1,680	415	850	111	370	154	935
13	87	82	415	750	1,140	1,210	252	1,100	111	217	182	595
14	74	99	1,360	695	1,070	1,280	234	1,100	96	132	164	370
15	82	96	1,440	595	1,070	1,300	200	1,000	77	168	154	217
16	105	108	1,070	695	1,070	1,280	175	850	62	330	123	200
17	93	111	810	645	1,210	1,440	158	750	96	252	252	252
18	87	147	695	550	935	1,680	147	700	252	154	870	550
19	74	200	595	505	810	1,280	117	600	150	182	438	310
20	82	310	550	482	810	1,070	105	500	117	392	252	217
21	87	810	505	572	695	1,000	82	380	108	200	178	1,140
22	84	1,140	572	1,680	645	870	105	290	87	132	141	2,400
23	80	1,440	1,000	5,240	572	750	126	234	70	96	129	1,520
24	82	1,760	1,000	3,060	505	695	141	200	96	82	114	750
25	80	1,680	870	1,760	528	595	175	438	80	74	82	645
26	82	1,440	645	1,070	482	505	252	645	330	252	74	1,000
27	84	1,280	528	810	438	460	271	695	350	182	74	595
28	82	870	482	750	810	415	330	460	217	102	67	460
29	82	695	505	750	-------	350	460	695	182	117	62	310
30	105	528	550	1,000	-------	310	415	1,520	595	123	62	271
31	108	-------	550	2,280	-------	290	-------	1,000	-------	105	67	-------

NOTE—Discharge does not include the water diverted from the Quemahoning Reservoir. Discharge May 1-21 estimated, because of unsatisfactory gage height record, from United States Weather Bureau gage heights observed at the Franklin Street gage.

Monthly discharge of Stony Creek at Johnstown, for the year ending Sept. 30, 1921

(Drainage area 468 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,000	74	182	0.620	0.71
November	1,760	72	497	1.26	1.41
December	1,920	392	792	1.88	2.17
January	5,240	482	1,330	3.01	3.47
February	2,560	438	1,170	2.74	2.85
March	5,510	290	1,580	3.65	4.21
April	528	82	235	.635	.71
May	4,400	200	942	2.12	2.44
June	595	62	191	.502	.56
July	592	74	167	.481	.55
August	1,520	62	288	.769	.89
September	2,460	62	616	1.54	1.72
The year	5,510	62	665	1.60	21.69

NOTE—Discharge does not include the water diverted from the Quemahoning Reservoir. Run-off includes the quantity of water diverted from the reservoir.

OHIO BASIN—STATION NO. 16

BLACKLICK CREEK AT BLACKLICK

Location.—At three-span steel highway bridge, about one quarter of a mile north of the Pennsylvania Railroad Station, Blacklick, Indiana County.

Drainage Area.—386 square miles.

Records Available.—August 16, 1904, to December 31, 1905, and January 8, 1907, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Miss Carrie Kelley.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Right bank is high and not subject to overflow; left begins to overflow at a stage of about 12.0 feet. Bed is composed of sand, gravel and boulders. Control is at a riffle about 200 feet below gage; may shift occasionally.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 7.3 feet at 1 p. m. May 5 (discharge, 6,110 second-feet); minimum, 2.20 feet on October 24, 6 p. m. October 25, June 21 and several times in July and August (discharge, 42 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined below 10,000 second-feet. Gage read to quarter tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

The following discharge measurement was made by H. L. Landis: No. 41, July 13: Gage height, 2.41 feet; discharge, 100 second-feet.

Daily Mean Gage Height, in feet, of Blacklick Creek at Blacklick, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.40	2.40	3.65	3.05	4.18	3.68	2.88	3.68	2.88	3.08	2.92	2.48
2	4.06	2.80	3.85	3.45	3.95	4.02	2.80	3.88	2.85	2.95	2.98	2.32
3	3.70	3.50	4.40	3.25	3.72	6.30	2.88	3.92	3.28	2.76	4.01	2.76
4	3.25	2.88	4.10	3.11	3.58	5.38	3.10	5.12	3.18	2.55	4.38	3.10
5	3.00	2.76	4.15	3.00	3.42	4.60	3.08	6.78	2.85	2.38	4.02	3.75
6	2.90	2.70	3.76	3.28	3.60	4.78	3.00	5.02	2.65	2.28	3.95	3.00
7	2.75	2.90	3.55	3.65	4.20	6.11	2.85	4.35	2.64	2.21	5.25	2.75
8	2.71	2.61	3.35	5.68	4.50	5.22	2.86	4.22	2.60	2.22	5.65	2.60
9	2.61	2.60	3.18	4.75	4.18	4.85	3.18	3.82	2.55	2.22	4.20	2.52
10	2.54	2.69	3.35	4.26	4.38	5.08	3.45	3.55	2.48	2.22	3.51	2.58
11	2.60	2.65	3.15	3.82	4.88	4.72	3.29	3.10	2.50	2.28	3.22	3.16
12	2.55	2.56	2.90	3.41	4.58	4.65	3.12	2.92	2.62	2.48	3.28	3.12
13	2.42	2.40	3.15	3.05	4.18	4.52	3.16	3.30	2.52	2.40	3.38	2.75
14	2.45	2.30	3.85	3.60	4.10	4.26	3.05	3.19	2.50	2.25	3.45	2.56
15	2.40	2.51	3.65	3.55	4.10	4.22	3.10	2.88	2.41	2.23	3.10	2.52
16	2.30	2.55	3.85	3.18	4.12	4.05	3.12	2.91	2.32	2.30	2.85	2.45
17	2.30	2.70	3.68	2.98	4.18	3.92	3.05	2.81	2.32	2.36	2.66	2.48
18	2.30	3.05	3.45	2.90	4.05	3.75	3.00	2.75	2.42	2.22	2.72	2.91
19	2.51	3.40	3.51	2.92	3.85	3.62	2.90	2.80	2.31	2.53	2.55	2.85
20	2.30	3.90	3.42	2.75	3.52	-------	2.91	2.71	2.28	3.81	2.55	2.55
21	2.30	4.70	3.00	2.99	3.41	-------	2.82	2.70	2.20	2.82	2.52	4.40
22	2.25	5.10	3.21	5.52	3.58	-------	2.81	2.60	2.51	2.48	2.48	5.02
23	2.25	4.95	4.22	6.50	3.42	-------	2.76	2.62	2.52	2.40	2.40	3.82
24	2.20	5.25	-------	5.46	3.32	-------	3.05	2.52	2.51	2.42	2.32	3.48
25	2.22	4.90	-------	4.58	3.15	-------	2.82	2.62	2.40	2.30	2.31	3.40
26	2.40	4.25	3.25	3.95	3.18	-------	2.80	2.68	2.48	2.68	2.30	3.05
27	2.60	4.05	3.50	3.55	3.05	-------	2.88	2.58	3.15	2.48	2.20	2.86
28	2.68	3.90	3.32	3.46	3.55	-------	2.92	2.61	3.12	2.55	2.20	2.75
29	2.51	3.65	3.15	3.58	-------	-------	3.15	3.12	3.28	3.65	2.22	2.65
30	2.50	3.50	3.06	4.25	-------	3.05	3.52	4.82	3.06	3.35	2.26	2.58
31	2.41	-------	3.06	4.95	-------	2.88	-------	3.54	-------	3.05	2.36	-------

NOTE—Stage-discharge relation Dec. 19, 20, Jan. 18 and 19 affected by ice. Gage height Dec. 24, 25 and Mar. 20-29 unsatisfactory.

Daily discharge, in second-feet, of Blacklick Creek at Blacklick, for the year ending ***Sept. 30, 1921***

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,330	90	725	365	1,160	760	281	760	281	390	300	118
2	1,030	245	872	592	950	990	245	910	268	315	330	68
3	760	625	1,330	472	760	4,060	281	910	500	227	990	227
4	472	281	1,070	390	690	2,520	390	2,090	445	142	1,330	390
5	340	227	1,160	340	560	1,520	390	5,060	268	85	990	798
6	290	200	798	500	690	1,730	340	1,960	180	59	950	340
7	222	290	658	725	1,160	3,690	268	1,330	176	44	2,230	222
8	204	164	530	3,000	1,420	2,230	272	1,160	160	46	2,840	160
9	164	160	445	1,730	1,160	1,730	445	835	142	46	1,160	132
10	139	196	530	1,240	1,330	2,090	592	658	118	46	625	153
11	160	180	418	835	1,840	1,620	500	390	125	59	445	418
12	142	146	290	560	1,520	1,520	390	300	168	118	500	390
13	97	90	418	365	1,160	1,420	418	500	132	90	560	222
14	108	63	872	690	1,070	1,240	365	445	125	52	592	146
15	90	128	725	658	1,070	1,160	390	281	94	59	390	132
16	63	142	872	445	1,070	1,030	390	295	68	63	268	108
17	63	200	760	330	1,160	910	365	250	68	79	184	118
18	63	365	592	240	1,030	798	340	222	97	46	209	295
19	66	560	480	200	872	690	290	245	66	136	142	268
20	63	910	400	222	625		295	204	59	835	142	142
21	63	1,620	340	335	560		254	200	42	254	132	1,330
22	52	2,090	445	2,680	690		250	160	125	118	118	1,960
23	52	1,960	1,160	4,460	560		227	168	132	90	90	835
24	42	2,230	850	2,680	500		365	132	128	97	68	625
25	46	1,840	550	1,520	418	540	254	168	90	63	66	560
26	90	1,160	472	950	445		245	192	118	192	63	365
27	160	1,030	625	658	365		281	153	418	118	42	272
28	192	910	500	592	658		300	164	390	142	42	222
29	128	725	418	690	-------		418	390	500	725	46	180
30	125	625	365	1,160	-------	365	625	1,730	365	530	55	153
31	94	-------	365	1,960	-------	281	-------	658	-------	365	79	-------

NOTE—Discharge Dec. 19, 20, Jan. 18 and 19 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for **Loyalhanna** Creek at New Alexandria. Discharge Dec. 24, 25 and Mar. 20-29 estimated, because of unsatisfactory gage height record, from discharge of Loyalhanna Creek at New Alexandria. Braced figures show mean discharge for period included.

Monthly discharge of Blacklick Creek at Blacklick, for the year ending ***Sept. 30, 1921***

(Drainage area 386 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,330	42	223	0.578	0.67
November	2,230	63	618	1.68	1.87
December	1,330	290	646	1.67	1.92
January	4,460	200	1,020	2.64	3.04
February	1,840	365	910	2.36	2.46
March	4,060	281	1,220	3.16	3.64
April	625	227	349	.904	1.01
May	5,060	132	739	1.91	2.20
June	500	42	195	.505	.56
July	835	44	182	.472	.54
August	2,840	42	515	1.33	1.53
September	1,960	68	378	.979	1.09
The year	5,060	42	585	1.52	20.53

OHIO BASIN—STATION NO. 17

LOYALHANNA CREEK AT NEW ALEXANDRIA

Location.—At single-span wooden covered highway bridge, New Alexandria, Westmoreland County.

Drainage Area.—264 square miles.

Records Available.—August 17, 1913, to August 31, 1918, and August 7, 1919, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by E. E. Huffman. Elevation of gage zero 917.26 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Both banks are high and do not overflow. Bed is composed of gravel and boulders. Control for low stages is at a gravel riffle about 50 feet below gage; practically permanent. Medium and high stage control is at a riffle, about 1,300 feet below gage, composed of gravel and boulders; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 7.2 feet at 11 a. m. January 8 (discharge, 3,850 second-feet); minimum, 1.56 feet at 7 a. m. November 16 and 6 a. m. June 22 (discharge, 56 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined below 4,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

The following discharge measurement was made by J. M. Snavely: No. 19, July 14; Gage height, 1.88 feet; discharge, 124 second-feet.

Daily Mean Gage Height, in feet, of Loyalhanna Creek at New Alexandria, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.91	1.68	2.58	2.34	3.68	3.38	2.63	2.55	2.21	2.16	1.69	1.67
2	2.99	1.85	3.84	2.68	3.38	3.43	2.59	2.63	2.11	2.02	1.80	1.69
3	2.52	2.48	3.62	2.66	3.32	6.11	2.66	2.58	2.03	1.88	2.76	1.76
4	2.25	2.18	3.21	2.50	3.36	4.84	2.36	2.96	2.00	1.82	2.40	2.32
5	2.12	1.72	3.17	2.58	3.64	4.16	2.29	5.45	1.89	1.77	2.04	3.68
6	2.03	1.74	2.99	2.44	4.32	3.81	2.22	4.25	1.83	1.72	1.92	2.77
7	1.97	1.72	2.69	2.53	3.72	5.52	2.23	3.37	1.78	1.68	2.22	2.58
8	1.92	1.73	2.57	6.00	3.70	4.54	2.15	3.17	1.76	1.66	2.20	2.15
9	1.89	1.76	2.47	4.64	4.92	4.33	2.57	2.89	1.73	1.97	1.95	2.02
10	1.86	1.71	2.39	3.66	4.26	4.58	2.68	2.61	1.72	1.82	1.82	3.78
11	1.81	1.66	2.37	3.22	4.73	4.03	2.71	2.50	1.69	1.76	1.78	3.80
12	1.77	1.64	2.34	2.99	4.21	4.13	2.64	2.43	1.70	2.61	1.80	2.78
13	1.75	1.66	2.27	2.70	3.63	4.41	2.56	2.35	1.68	2.00	1.80	2.46
14	1.74	1.67	2.53	3.54	3.63	3.79	2.52	2.24	1.64	1.84	1.80	2.24
15	1.72	1.63	3.00	3.75	3.38	3.53	2.48	2.17	1.62	2.70	1.86	2.10
16	1.70	1.98	2.85	3.10	3.25	3.48	2.38	2.12	1.60	3.37	1.72	2.02
17	1.68	2.66	2.73	2.80	3.03	3.45	2.31	2.03	1.60	2.32	1.72	1.96
18	1.68	2.67	2.61	2.41	2.85	3.41	2.22	1.97	1.72	1.96	2.34	2.40
19	1.68	2.58	2.43	2.30	2.68	3.04	2.18	1.92	1.69	2.44	2.18	2.07
20	1.68	3.41	2.29	2.46	2.55	2.93	2.04	1.88	1.60	2.38	2.00	1.94
21	1.67	4.00	1.97	2.73	2.59	2.77	2.02	1.84	1.58	2.02	1.87	3.22
22	1.66	3.67	2.52	4.66	2.65	2.78	2.02	1.81	1.57	1.93	1.78	4.01
23	1.66	3.50	3.97	6.45	2.79	2.63	2.04	1.81	2.22	1.85	1.72	2.92
24	1.66	3.43	3.45	4.71	2.65	2.52	2.07	1.81	1.80	1.80	1.70	2.52
25	1.66	3.35	2.85	3.70	2.48	2.52	1.95	2.13	1.67	1.75	1.68	2.40
26	1.68	3.37	2.72	3.04	2.51	2.42	1.91	2.13	3.69	1.72	1.65	2.92
27	1.84	3.39	2.77	2.86	2.89	2.40	1.89	1.87	4.14	1.70	1.60	2.60
28	1.89	2.91	2.73	2.66	3.76	2.40	1.97	1.85	3.22	1.68	1.60	2.42
29	1.80	2.61	2.36	2.68	-------	2.42	2.59	1.97	2.63	1.68	1.62	2.28
30	1.76	2.51	2.45	3.23	-------	2.26	2.57	3.23	2.38	1.69	1.60	2.20
31	1.73	-------	2.39	4.92	-------	2.22	-------	2.55	-------	1.76	1.60	-------

Daily discharge, in second-feet, of Loyalhanna Creek at New Alexandria, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,090	79	385	276	970	795	408	362	228	211	81	78
2	575	118	1,030	430	795	795	385	408	194	166	105	81
3	340	332	910	408	740	2,790	408	385	169	125	452	96
4	242	218	685	340	795	1,710	284	550	160	110	300	268
5	197	87	685	385	910	1,290	256	2,180	128	98	172	970
6	169	92	575	316	1,360	1,030	232	1,290	112	87	136	452
7	151	87	430	362	970	2,260	236	795	101	79	232	385
8	136	90	362	2,700	970	1,500	208	685	96	76	225	208
9	128	96	328	1,570	1,780	1,360	362	525	90	151	145	166
10	120	85	296	970	1,360	1,570	430	385	87	110	110	1,030
11	108	76	288	685	1,640	1,150	430	340	81	96	101	1,030
12	98	72	276	575	1,290	1,220	408	312	83	385	105	475
13	94	76	250	430	910	1,430	362	280	79	160	105	324
14	92	78	362	850	910	1,030	340	239	72	115	105	239
15	87	70	575	1,030	795	850	332	214	69	430	120	190
16	83	154	500	630	685	850	292	197	65	795	87	166
17	79	408	452	475	575	795	264	169	65	268	87	148
18	79	408	385	304	500	795	232	151	87	148	276	300
19	79	385	312	260	430	575	218	136	81	316	218	181
20	79	795	256	324	362	550	172	125	65	292	160	142
21	78	1,150	151	452	385	452	166	115	62	166	122	685
22	76	910	340	1,640	408	475	166	108	60	139	101	1,150
23	76	850	1,150	3,150	475	408	172	108	232	118	87	525
24	76	795	795	1,640	408	340	181	108	105	105	83	340
25	76	795	500	970	332	340	145	200	78	94	79	300
26	79	795	430	575	340	308	133	200	970	87	74	525
27	115	795	452	500	525	300	128	122	1,220	83	65	385
28	128	525	452	408	1,030	300	151	118	685	79	65	308
29	105	385	284	430	-------	308	385	151	408	79	69	253
30	96	340	320	685	-------	246	362	685	292	81	65	225
31	90	-------	296	1,780	-------	232	-------	362	-------	96	65	-------

Monthly discharge of Loyalhanna Creek at New Alexandria, for the year ending Sept. 30, 1921

(Drainage area 264 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	1,090	76	162	0.614	0.71
November	1,150	70	372	1.41	1.57
December	1,150	151	468	1.77	2.04
January	3,150	260	824	3.12	3.60
February	1,780	332	809	3.06	3.19
March	2,790	232	905	3.43	3.95
April	430	128	275	1.04	1.16
May	2,180	108	387	1.47	1.70
June	1,220	60	207	.784	.87
July	795	76	172	.652	.75
August	452	65	135	.511	.59
September	1,150	78	388	1.47	1.64
The year	3,150	60	423	1.60	21.77

OHIO BASIN—STATION NO. 18

KISKIMINITAS RIVER AT AVONMORE

Location.—At four-span steel highway bridge, Avonmore, Westmoreland County.

Drainage Area.—1,720 square miles.

Records Available.—May 29, 1907, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by J. H. Shupe. Elevation of gage zero 805.64 feet, United State Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Right bank is high and not subject to overflow; left bank is low and overflow begins at high stages. Bed is composed of gravel. Control is at the first of a series of riffles about 500 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 15.6 feet at noon January 23 (discharge, 22,500 second-feet); minimum, estimated from hydrograph, 2.5 feet at 4.45 p. m. June 18 (discharge, 330 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined below 30,000 second-feet. Gage read to half tenths twice daily; during high stages more frequently. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Kiskiminitas River at Avonmore, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
38	May 18	J. M. Snavely	3.97	1,370
39	July 8*	H. L. Landis and J. M. Snavely	2.81	458

* Measurement made by wading 100 feet above gage.

Daily Mean Gage Height, in feet, of Kiskiminitas River at Avonmore, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.55	2.92	5.53	4.52	8.82	6.80	4.65	5.25	5.25	4.04	3.55	2.78
2	6.87	3.03	7.48	4.95	7.35	6.98	4.92	5.65	4.25	3.48	3.30	2.80
3	5.55	4.12	8.32	5.75	6.70	12.60	4.75	5.75	3.95	3.45	4.70	3.48
4	4.60	4.42	7.25	5.25	6.15	13.23	4.52	6.05	4.00	3.05	6.22	4.50
5	4.32	3.78	6.85	5.00	6.60	10.16	4.35	12.89	3.80	2.90	4.85	6.58
6	3.95	3.40	6.40	5.00	8.54	9.14	4.19	11.68	3.40	2.90	3.95	5.52
7	3.72	3.42	5.92	4.85	8.02	11.38	4.09	8.85	3.25	2.90	4.07	4.55
8	3.55	3.18	5.45	8.38	7.65	10.72	3.95	7.75	3.10	2.90	8.07	3.92
9	3.38	3.10	5.10	10.53	7.50	9.40	4.27	6.79	3.08	2.95	5.94	3.48
10	3.28	3.20	4.82	8.33	8.45	10.17	4.99	6.02	3.00	2.95	4.70	3.72
11	3.20	3.15	4.82	7.26	9.15	8.87	4.89	5.49	2.95	2.95	4.22	6.60
12	3.12	3.10	4.65	6.40	8.60	7.93	4.72	5.17	2.90	3.66	3.90	6.28
13	3.10	3.00	4.42	5.60	7.72	8.72	4.62	5.25	2.90	3.70	3.82	4.91
14	3.02	3.00	5.03	6.00	7.45	8.42	4.49	5.17	2.82	3.30	3.70	4.18
15	3.00	2.80	7.66	6.90	7.50	7.72	4.45	4.69	2.78	3.00	3.80	3.71
16	2.92	2.95	6.55	5.80	7.15	7.48	4.37	4.35	2.72	4.11	3.55	3.48
17	2.90	4.40	6.10	5.38	7.15	7.65	4.27	4.12	2.68	3.67	3.30	3.32
18	2.90	4.90	5.65	4.37	6.95	7.12	4.29	3.96	-------	3.35	3.60	3.80
19	2.88	4.72	5.22	6.11	6.18	6.79	4.12	3.85	-------	3.35	4.22	4.55
20	2.82	5.42	4.95	6.60	6.00	6.29	3.97	3.70	2.78	4.75	3.72	3.75
21	-------	7.80	4.50	5.15	5.35	5.97	3.89	3.58	2.70	4.20	3.30	5.60
22	-------	8.45	4.65	8.08	5.62	5.82	3.79	3.48	2.71	3.42	3.12	9.76
23	-------	8.62	6.66	15.12	5.42	5.42	3.75	3.40	3.48	3.10	3.00	7.48
24	-------	8.30	7.44	11.99	5.65	5.12	3.77	3.40	3.08	2.90	2.90	5.70
25	-------	8.62	6.25	8.80	5.00	5.09	3.95	3.62	2.98	2.80	2.88	4.98
26	-------	8.40	5.50	7.12	5.00	5.02	3.75	4.10	3.60	2.80	2.88	5.50
27	-------	7.40	5.62	6.38	5.42	4.75	3.67	3.85	4.84	2.88	2.80	5.15
28	3.05	6.65	5.70	5.95	6.65	4.67	3.67	3.65	5.07	2.98	2.72	4.62
29	3.18	6.10	4.82	5.65	-------	4.75	4.19	3.60	4.05	3.02	2.70	4.42
30	3.22	5.58	4.80	5.86	-------	4.55	5.19	5.73	4.08	4.16	2.70	3.92
31	3.10	-------	4.72	9.38	-------	4.37	-------	6.21	-------	3.78	2.70	-------

NOTE—Gage height Oct. 21-27, June 18 and 19 unsatisfactory. Stage-discharge relation Jan. 19 and 20 affected by ice.

Daily discharge, in second-feet, of Kiskiminitas River at Avonmore, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,400	540	2,800	1,770	7,160	4,360	1,860	2,460	2,460	1,320	1,020	480
2	4,490	632	5,270	2,250	5,140	4,620	2,150	2,920	1,500	945	805	480
3	2,920	1,410	6,410	3,140	4,240	14,700	2,050	3,140	1,320	910	1,960	945
4	1,860	1,680	4,880	2,460	3,620	16,200	1,770	3,380	1,320	632	3.620	1,770
5	1,590	1,160	4,360	2,250	4,120	9,550	1,680	15,400	1,160	540	2,050	4,120
6	1,320	875	3,860	2,250	6,710	7,620	1,500	12,600	875	540	1,320	2,800
7	1,090	875	3,260	2,050	5,960	12,000	1,410	7,160	770	540	1,410	1,860
8	1,020	735	2,680	6,560	5,400	10,500	1,320	5,680	665	540	6,110	1,240
9	875	665	2,360	10,100	5,270	8,120	1,590	4,360	665	570	3,260	945
10	805	735	2,050	6,410	6,560	9,550	2,250	3,380	600	570	1,960	1,090
11	735	700	2,050	5,010	7,780	7,310	2,150	2,800	570	570	1,500	4,120
12	665	665	1,860	3,860	6,860	5,820	1,960	2,460	540	1,090	1,240	3,740
13	665	600	1,680	2,920	5,540	7,010	1,860	2,460	540	1,090	1,160	2,150
14	600	600	2,250	3,380	5,140	6,560	1,770	2,460	480	805	1,090	1,500
15	600	480	5,540	4,490	5,270	5,540	1,680	1,960	480	600	1,160	1,090
16	540	570	4,120	3,140	4,880	5,270	1,680	1,680	425	1,410	1,020	945
17	540	1,680	3,500	2,680	4,880	5,400	1,590	1,410	425	1,090	805	805
18	540	2,150	2,920	1.680	4,620	4,750	1,590	1,320	360	840	1,020	1,160
19	540	1,960	2,460	1,600	3,620	4,360	1,410	1,160	500	840	1,500	1,860
20	480	2,680	3,250	1,900	3,380	3,740	1,320	1,090	480	2,050	1,090	1,160
21	460	5,680	1,770	2,460	2,680	3,380	1,240	1,020	425	1,500	805	2,920
22	420	6,560	1,860	6,110	2,920	3,140	1,160	945	425	875	665	8,800
23	480	6,860	4,240	21,100	2,680	2,680	1,160	875	945	665	600	5,270
24	420	6,410	5,140	13,300	2,920	2,360	1,160	875	665	540	540	3,030
25	400	6,860	3,620	7,160	2,250	2,360	1,320	1,020	600	480	540	2,250
26	340	6,560	2,800	4,750	2,250	2,250	1,160	1,410	1,020	480	540	2,800
27	380	5,140	2,920	3,860	2,680	2,050	1,090	1,160	2,050	540	480	2,460
28	632	4,120	3,030	3,380	4,120	1,960	1,090	1,020	2,360	600	425	1,860
29	735	3,500	2,050	2,920	-------	2,050	1,500	1,020	1,320	600	425	1,680
30	735	2,920	2,050	3,260	-------	1,860	2,460	3,030	1,410	1,500	425	1,240
31	665	-------	1,960	8,120	-------	1,680	-------	3,620	-------	1,160	425	-------

NOTE—Discharge Oct. 21-27, June 18 and 19 estimated, because of unsatisfactory gage height record, from study of gage height graphs for Kiskiminitas River at Salisburg and Vandergrift. Discharge Jan. 19 and 20 estimated, because of ice, from weather records, study of gage height graph and comparison with gage height record for Kiskiminitas River at Vandergrift.

Monthly discharge of Kiskiminitas River at Avonmore, for the year ending Sept. 30, 1921

(Drainage area 1,720 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	5,400	340	1,060	0.616	0.71
November	6,860	480	2,530	1.47	1.64
December	6,410	1,680	3,160	1.84	2.12
January	21,100	1,600	4,720	2.74	3.16
February	7,780	2,250	4,590	2.67	2.78
March	16,200	1,680	5,770	3.35	3.86
April	2,460	1,090	1,600	.930	1.04
May	15,400	875	3,070	1.78	2.05
June	2,460	360	912	.530	.59
July	2,050	480	853	.496	.57
August	6,110	425	1,320	.767	.88
September	8,800	480	2,220	1.29	1.44
The year	21,100	340	2,640	1.53	20.84

KISKIMINITAS RIVER AT VANDERGRIFT

Location.—At pump house of the American Steel and Tin Plate Company, about 300 feet downstream from the Pennsylvania Railroad station, Vandergrift, Westmoreland County.

Drainage Area.—1,830 square miles.

Records Available.—November 1, 1915, to September 30, 1921.

Gage.—A float type gage is installed at the pump house sump well, which operates through a 3 inch pipe and indicates the river stage on a vertical staff inside the pumping station; read to feet and inches twice daily by pump house engineer; during high stages more frequently. Elevation of gage zero 767.14 feet, United States Geological Survey datum.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of gravel and rock.

Extremes of Stage.—Maximum gage height during the year, 14.83 feet observed at 5 p. m. January 23; minimum, 2.83 feet from 6 a. m. August 30 to 5 p. m. August 31, and at 5 p. m. September 2.

Ice.—Stage-discharge relation usually affected by ice.

Cooperation.—Record is furnished by the American Steel and Tin Plate Company, Vandergrift.

Daily Mean Gage Height, in feet, of Kiskiminitas River at Vandergrift, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.92	3.29	5.84	5.25	9.00	7.38	5.00	5.46	5.65	4.33	4.38	2.92
2	7.29	3.17	7.42	5.25	7.71	7.00	5.08	5.50	4.73	4.00	4.17	2.87
3	5.96	4.21	8.58	5.84	7.12	10.87	5.12	6.00	4.42	3.83	4.17	3.09
4	5.25	4.79	7.88	5.84	6.58	13.02	5.12	6.04	4.50	3.42	5.77	3.88
5	4.88	4.50	7.04	5.46	6.54	10.12	5.00	10.83	4.33	3.54	5.67	5.91
6	4.58	4.16	6.96	5.33	7.50	9.30	5.00	11.92	4.33	3.30	5.17	6.01
7	4.38	3.75	6.54	5.29	8.42	10.75	4.92	9.38	4.04	3.00	4.82	4.96
8	4.04	3.54	6.08	8.35	8.00	10.85	4.79	8.17	3.92	3.00	8.32	4.50
9	3.88	3.46	5.75	10.62	7.62	9.29	4.71	7.17	3.67	3.25	7.00	3.83
10	3.71	3.54	5.46	8.62	7.96	9.88	5.12	6.58	3.58	3.00	5.46	4.50
11	3.54	3.50	5.33	7.34	8.62	8.88	5.33	6.29	3.50	3.42	4.92	6.73
12	3.62	3.46	5.25	6.75	8.67	7.92	5.33	5.88	3.38	3.97	4.38	6.67
13	3.50	3.33	5.12	5.92	7.92	8.29	5.25	5.67	3.33	3.92	4.33	5.46
14	3.42	3.25	5.08	5.84	7.42	8.58	5.17	5.79	3.25	3.83	4.29	4.71
15	3.54	3.42	7.58	7.16	7.34	7.66	5.08	5.46	3.17	3.42	4.00	4.29
16	3.38	3.25	7.12	7.00	7.08	7.33	5.00	5.25	3.17	4.25	3.67	3.83
17	3.33	4.92	6.58	5.84	7.00	7.38	5.00	5.00	3.00	4.50	3.54	3.71
18	3.29	5.25	6.33	4.84	7.25	7.08	5.00	4.83	2.92	4.20	3.54	3.71
19	3.25	5.04	6.25	4.25	6.58	6.92	4.92	4.67	3.25	3.80	4.08	4.75
20	3.17	5.25	6.25	4.46	6.12	6.54	4.67	4.62	3.21	5.29	4.42	4.33
21	3.12	7.29	5.50	5.46	5.96	6.16	4.58	4.50	3.17	5.08	3.96	5.28
22	3.08	8.00	5.16	7.27	5.92	6.00	4.50	4.25	3.08	4.25	3.58	9.13
23	3.17	8.33	6.58	14.01	5.75	5.88	4.42	4.00	4.72	3.88	3.42	7.96
24	3.08	8.21	7.79	12.00	5.92	5.71	4.50	3.92	3.58	3.79	3.33	6.33
25	3.04	8.16	7.42	8.58	5.67	5.54	4.75	3.79	3.42	3.58	3.25	5.42
26	2.92	8.33	7.21	6.66	5.46	5.46	4.54	4.08	3.25	3.46	3.17	5.38
27	2.92	7.66	6.33	6.08	8.00	5.38	4.38	4.33	4.57	3.33	3.17	5.46
28	3.00	6.96	6.08	5.84	7.29	5.29	4.33	4.00	5.50	3.29	3.00	5.00
29	3.21	6.66	5.42	6.29	-------	5.17	4.38	3.71	4.67	3.29	2.92	4.79
30	3.42	6.21	4.75	5.75	-------	5.25	4.58	5.60	4.33	4.21	2.83	4.42
31	3.38	-------	4.33	8.25	-------	5.04	-------	6.59	-------	4.33	2.83	-------

OHIO BASIN—STATION NO. 20

ALLEGHENY RIVER AT FREEPORT

Location.—At three-span steel highway bridge, Freeport, Armstrong County, about 500 feet above mouth of Buffalo Creek.

Drainage Area.—11,400 square miles, including Buffalo Creek.

Records Available.—April 16, 1873, to September 30, 1921.

Gage.—Painted staff on first pier from right bank; read to tenths twice daily by Mrs. Annie R. Burtner; during high stages more frequently. Elevation of gage zero 734.98 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of sand and gravel. Control is at a riffle about two miles below the station.

Extremes of Stage.—Maximum stage during the year, estimated from hydrograph, 17.0 feet at 11 a. m. March 8; minimum, 1.9 feet at 8 a. m. September 3.

Ice.—Stage-discharge relation usually affected by ice.

Cooperation.—Station is maintained in cooperation with the United States Engineer Office, Pittsburgh.

Discharge Measurements of Allegheny River at Freeport, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
19	July 8	H. L. Landis	2.80	2,820
		Buffalo Creek discharge		14.7
		Total		2,834.07
20	21	H. J. McIntyre	3.45	4,820
		Buffalo Creek discharge		13.0
		Total		4,833.0

*Daily Mean Gage Height, in feet, of Allegheny River at Freeport, for the year endin
Sept. 30, 1921*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.9	3.1	6.8	5.9	8.1	7.3	9.2	11.55	6.35	4.15	3.4	2.0
2	6.35	3.35	7.5	6.85	6.9	7.25	9.6	10,55	5.65	4.8	3.15	2.0
3	5.8	4.05	9.1	8.55	6.5	9.5	9.35	9.25	5.2	4.2	3.1	2.0
4	5.4	4.4	9.7	9.85	5.95	12.15	8.5	8.2	4.75	3.6	4.15	2.5
5	5.0	4.4	9.25	9.15	6.05	11.4	7.65	9.55	4.35	3.25	3.85	3.45
6	4.45	4.25	8.9	8.3	7.6	11.1	7.1	10.0	4.15	2.9	3.4	4.15
7	4.1	3.95	9.15	7.8	8.3	13.65	6.35	8.45	3.75	2.5	3.3	3.55
8	3.65	3.9	8.7	8.6	8.5	16.70	5.95	7.55	3.45	2.35	6.35	3.05
9	3.1	3.55	7.9	10.35	8.65	15.55	6.3	6.85	3.05	2.65	7.45	3.0
10	3.0	3.45	7.15	9.75	9.4	15.1	6.9	6.25	3.25	2.8	5.5	2.85
11	3.0	3.25	6.55	8.45	9.55	14.05	7.5	5.75	3.15	2.75	4.4	3.9
12	2.95	3.6	6.25	7.55	9.35	12.4	7.45	5.4	3.1	3.1	4.05	4.4
13	2.75	3.85	6.0	6.9	8.35	11.75	7.0	4.85	3.1	3.1	4.0	4.1
14	2.7	3.55	6.05	6.35	7.65	11.95	6.45	4.75	3.15	3.3	3.75	3.85
15	2.7	3.3	8.6	6.85	7.3	11.0	6.25	4.8	3.3	3.45	3.5	3.35
16	2.7	3.1	10.25	6.4	7.2	10.2	6.25	4.7	3.05	3.6	3.4	3.0
17	2.6	3.75	9.45	6.2	7.6	10.3	6.3	4.5	2.85	3.55	3.25	2.9
18	2.55	4.7	8.35	6.05	11.1	9.55	6.35	4.35	2.8	3.25	3.2	4.85
19	2.6	5.0	7.55	7.5	11.55	9.25	7.45	4.2	2.8	3.05	3.3	5.7
20	2.5	5.65	6.9	7.7	9.95	8.5	7.85	3.95	2.7	3.45	3.7	6.05
21	2.5	7.25	5.8	8.3	8.75	8.3	7.15	3.65	2.5	3.1	3.5	6.8
22	2.45	8.2	5.6	8.55	7.55	8.8	6.4	3.45	2.4	3.0	3.3	10.3
23	2.4	10.15	7.0	13.0	7.1	8.95	6.05	3.4	3.45	3.1	3.2	8.9
24	2.4	12.15	8.65	12.8	6.85	8.35	6.0	3.35	2.8	3.3	2.95	7.5
25	2.3	11.9	8.85	10.75	6.3	7.85	6.2	4.1	2.65	3.1	2.7	6.3
26	2.3	11.35	7.8	8.6	5.55	7.6	6.45	5.25	2.45	2.75	2.5	5.75
27	2.55	10.35	7.05	6.95	5.75	7.5	6.05	4.85	3.0	2.65	2.55	5.8
28	2.75	9.4	7.15	6.5	6.95	7.3	5.85	4.7	3.35	2.7	2.5	5.4
29	2.75	8.35	6.6	6.0	-------	8.6	6.5	5.05	2.95	2.6	2.3	4.95
30	3.0	7.6	6.15	6.0	-------	10.05	9.3	7.2	2.95	3.2	2.1	4.45
31	3.0	-------	5.8	7.65	-------	9.55	-------	7.45	-------	4.05	2.0	-------

NOTE—Stage-discharge relation Jan. 19-21 affected by ice.

OHIO BASIN—STATION NO. 21

SOUTH FORK TEN MILE CREEK AT POLLOCK'S MILL

Location.—At single-span steel highway bridge, about two miles below Jefferson, at Pollock's Mill, Greene County.

Drainage Area.—190 square miles.

Records Available.—June 22, 1915, to September 30, 1921.

Gage.—Staff attached to downstream corner of right abutment; read to tenths twice daily by James M. Pollock.

Discharge Measurement.—Made from upstream side of bridge or by wading.

Channel and Control.—Right bank is high and not subject to overflow left begins to overflow at a stage of about 7 feet. Bed is a formation of rock shingle and gravel. Control is at a riffle about 200 feet below gage; may shift occasionally.

Extremes of Stage.—Maximum gage height during the year, 7.4 feet observed at 7 a. m. May 25; minimum, 1.0 foot from 6 p. m. July 28 to 6 p. m. July 30 and on August 1.

Ice.—Stage-discharge relation usually affected by ice.

Cooperation.—Station is maintained in cooperation with United States Engineer Office, Pittsburgh.

Discharge Measurements of South Fork Ten Mile Creek at Pollock's Mill, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
10	Apr. 9	J. M. Snavely	2.34	322
11	9	J. M. Snavely	2.31	320
12	May 17	J. M. Snavely	1.40	35.3
13	July 9	J. M. Snavely	1.48	39.1

Daily Mean Gage Height, in feet, of South Fork Ten Mile Creek at Pollock's Mill, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.25	1.45	2.3	1.7	3.15	2.7	2.85	1.8	1.75	1.4	1.0	1.1
2	1.85	1.65	3.15	1.95	2.55	3.05	2.55	1.75	1.6	1.3	1.65	1.25
3	1.6	1.7	2.5	1.9	2.3	4.25	2.4	1.7	1.5	1.2	2.6	1.3
4	1.5	1.85	2.25	1.8	2.2	3.05	2.3	1.7	1.5	1.2	2.25	1.3
5	1.45	1.75	2.0	1.7	2.3	2.75	2.05	2.7	1.5	1.2	1.75	1.3
6	1.4	1.7	1.9	1.7	3.05	2.55	1.8	2.35	1.4	1.2	1.35	1.4
7	1.4	1.7	1.7	2.15	2.6	3.0	1.8	2.0	1.35	1.2	1.5	1.4
8	1.4	1.5	1.6	5.5	2.4	2.8	2.0	1.7	1.3	1.55	1.85	1.55
9	1.3	1.4	1.6	3.3	2.35	2.45	2.2	1.7	1.3	1.72	1.75	1.4
10	1.2	1.4	1.6	2.55	2.45	2.95	2.2	1.7	1.2	1.25	1.55	1.4
11	1.2	1.3	1.7	2.35	2.85	2.7	1.95	1.7	1.2	1.2	1.4	1.45
12	1.2	1.3	1.6	2.1	3.1	2.75	1.8	1.6	1.4	1.2	2.3	1.5
13	1.2	1.3	1.6	2.4	2.6	3.55	1.8	1.6	1.3	1.2	2.25	1.4
14	1.2	1.3	2.0	3.7	2.45	2.45	1.7	1.5	1.25	1.2	1.95	1.4
15	1.2	1.3	2.45	3.3	2.3	2.4	1.7	1.5	1.2	1.3	1.75	1.3
16	1.2	1.75	2.4	2.75	2.15	2.5	1.65	1.4	1.2	1.35	1.55	1.25
17	1.2	2.7	2.0	2.3	2.05	2.4	1.6	1.4	1.2	1.3	1.5	1.2
18	1.2	2.4	1.9	2.2	1.9	2.25	1.6	1.4	2.7	1.2	1.5	1.35
19	1.2	2.2	1.7	2.1	1.9	2.1	1.55	1.4	2.25	1.2	1.4	1.2
20	1.2	2.2	1.7	1.9	1.9	2.05	1.5	1.4	1.7	1.2	1.4	1.35
21	1.2	2.1	2.0	2.0	2.0	2.0	1.5	1.3	1.55	1.2	1.35	3.35
22	1.2	2.0	2.4	2.75	1.9	1.9	1.5	1.3	1.35	1.1	1.3	3.55
23	1.2	2.15	2.5	3.75	2.15	1.8	1.5	1.3	1.35	1.1	1.2	2.0
24	1.2	2.3	2.35	3.05	2.25	1.7	1.5	2.05	1.3	1.1	1.2	1.7
25	1.2	2.5	2.2	2.3	2.1	1.6	1.45	5.25	1.3	1.1	1.2	1.9
26	1.2	2.1	2.19	2.2	2.1	1.75	1.4	2.9	2.7	1.1	1.1	2.85
27	1.4	2.1	2.1	2.2	2.4	1.7	1.45	2.2	2.35	1.1	1.1	2.45
28	1.8	1.8	2.7	2.2	3.15	2.0	1.85	1.85	1.8	1.05	1.1	2.1
29	1.5	1.7	2.3	1.85	------	2.3	2.2	2.0	1.55	1.0	1.1	1.9
30	1.35	1.75	1.95	2.75	------	2.0	1.95	2.1	1.4	1.0	1.1	1.8
31	1.3	------	1.7	4.05	------	2.45	------	1.95	------	1.1	1.1	------

NOTE—Stage-discharge relation Jan. 26-28 affected by ice.

OHIO BASIN—STATION NO. 22

MONONGAHELA RIVER AT SOUTH BROWNSVILLE

Location.—At four-span steel highway bridge, known as Brownsville Bridge, South Brownsville, Fayette County, about one quarter of a mile downstream from Lock No. 5.

Drainage Area.—5,130 square miles.

Records Available.—February 18, 1915, to September 30, 1921.

Gage.—Staff in two sections. Lower section is at Lock No. 5, attached to downstream side of middle wall, graduated from zero to 32.4 feet. Upper section is about 200 feet below the lower lock gate, on railroad embankment, graduated from 31.0 feet to 45.5 feet. Gage read to tenths twice daily by Charles W. Keibler; during high stages more frequently. Elevation of gage zero 726.23 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge.

Channel and Control.—Right bank is high and not subject to overflow; left is overflowed during extremely high stages. Control is lock and dam No. 4. Flashboards are used on the dam during low water which affect the stage-discharge relation.

Extremes of Stage.—Maximum gage height during the year, estimated from hydrograph, 26.7 feet at 10 p. m. March 3; minimum, 10.4 feet at 8 a. m. June 11 and 8 p. m. August 25.

Ice.—Stage-discharge relation usually affected by ice.

Cooperation.—Station is maintained in cooperation with United States Engineer Office, Pittsburgh.

Daily Mean Gage Height, in feet, of Monongahela River at South Brownsville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12.25	11.3	13.45	12.3	17.4	16.5	12.0	12.95	16.8	12.9	11.7	11.45
2	13.15	11.15	15.0	12.35	15.7	15.9	12.9	12.6	13.75	13.05	11.8	11.3
3	13.1	11.2	15.7	12.5	14.3	22.4	13.3	12.4	12.6	12.6	13.5	11.15
4	12.65	11.45	14.9	12.8	13.5	24.6	12.85	12.35	12.65	12.2	17.4	11.1
5	12.25	11.85	14.25	12.5	13.15	19.5	12.4	14.0	11.7	12.1	16.4	11.1
6	11.95	11.8	14.1	12.45	14.0	16.3	12.1	17.1	11.35	12.0	13.3	11.45
7	11.8	11.7	14.1	12.3	14.65	15.9	11.75	16.2	11.05	11.7	12.15	13.5
8	11.6	11.55	13.6	14.8	14.3	15.2	11.7	14.65	10.95	11.6	12.6	14.4
9	11.55	11.4	13.2	17.6	14.0	14.35	11.7	13.45	10.75	11.6	12.7	13.4
10	11.4	11.4	12.85	16.4	16.9	15.45	11.95	12.75	10.55	11.8	12.0	12.6
11	11.4	11.45	12.55	14.6	19.0	15.3	12.3	12.2	10.65	11.9	11.4	12.7
12	11.3	11.5	12.55	13.6	16.9	14.4	12.3	11.9	11.6	12.2	11.05	12.55
13	11.2	11.6	12.4	13.0	15.3	14.05	12.1	11.8	11.8	12.3	10.95	12.4
14	11.2	11.65	12.4	14.4	14.55	13.7	11.85	12.1	11.7	12.2	10.8	12.3
15	11.1	11.6	15.3	18.7	13.9	13.35	11.7	12.0	11.55	12.6	11.0	12.1
16	11.15	11.4	15.7	17.15	13.7	13.7	11.6	11.65	11.8	12.95	14.0	12.0
17	11.0	12.4	14.6	15.3	13.25	14.75	11.7	11.4	11.8	12.9	13.0	11.8
18	11.0	14.1	13.95	13.65	12.9	14.4	11.7	11.3	11.8	12.6	12.3	11.75
19	11.0	14.0	13.3	12.8	12.5	13.6	11.7	11.0	12.6	12.25	12.8	11.7
20	10.9	13.5	12.8	12.4	12.35	13.1	11.6	11.0	14.6	12.05	12.0	11.6
21	10.9	13.95	12.5	12.6	12.1	12.7	11.5	10.85	14.2	12.05	11.55	12.3
22	10.85	14.45	12.7	12.9	12.0	12.5	11.3	10.65	12.85	12.6	11.0	13.8
23	10.8	15.35	17.6	15.0	11.95	12.2	11.35	10.6	12.4	12.45	10.85	15.0
24	10.8	15.6	21.0	16.6	13.05	12.05	11.25	10.7	12.2	12.05	10.65	14.0
25	10.8	15.0	17.3	15.25	12.85	12.0	11.2	15.8	12.2	11.9	10.5	13.1
26	10.75	14.6	14.8	14.05	13.1	12.0	11.2	16.9	12.8	11.7	11.05	13.8
27	10.8	14.3	13.65	13.3	12.95	12.0	11.2	15.4	12.95	11.4	11.45	13.55
28	10.8	13.85	13.25	12.75	15.4	12.0	11.25	13.8	12.75	11.2	11.5	13.05
29	10.9	13.3	12.9	12.45	-------	12.0	11.95	12.75	12.5	11.2	11.5	12.95
30	10.9	13.1	12.65	12.65	-------	12.0	12.85	19.0	12.4	11.4	11.3	12.7
31	11.1	------	12.3	15.1	-------	12.0	-------	21.6	-------	11.45	11.55	------

OHIO BASIN—STATION NO. 23

YOUGHIOGHENY RIVER NEAR CONFLUENCE

Location.—At two-span steel highway bridge, about one half mile upstream from the mouth of the Casselman River, and about one half mile southwest of Confluence, Somerset County.

Drainage Area.—435 square miles.

Records Available.—September 15, 1904, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to hundredths twice daily by Walter Shipley. Elevation of gage zero 1,309.79 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Right bank is high and not subject to overflow; left is low and is overflowed during high stages. Bed is rocky and not subject to change. Control for low stages is at the railroad bridge about 200 feet below the gage; for medium and high stages at the railroad bridge about 3,500 feet below gage. Stage-discharge relation is subject to backwater effects from the Casselman River.

Extremes of Stage.—Maximum gage height during the year, estimated from hydrograph, 9.8 feet at 1 p. m. March 3; minimum, 1.57 feet at 6 a. m. July 29.

Ice.—Stage-discharge relation usually affected by ice.

Discharge Measurements of Youghiogheny River near Confluence, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
10	Apr. 7	J. M. Snavely	2.32	271
41	July 12	J. M. Snavely	2.01	179

Daily Mean Gage Height, in feet, of Youghiogheny River near Confluence, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.55	1.72	3.67	2.87	3.93	3.32	2.58	2.70	3.58	2.83	1.96	1.70
2	3.42	1.81	4.44	3.44	3.60	4.65	2.58	2.64	3.26	2.41	2.18	1.65
3	3.04	2.33	4.26	3.56	3.31	9.10	2.52	2.62	3.04	2.23	5.72	1.82
4	2.69	2.50	4.02	3.36	3.16	7.72	2.44	3.06	2.86	2.09	5.63	2.03
5	2.50	2.20	3.96	3.28	3.22	5.67	2.36	6.17	2.76	2.01	3.75	1.81
6	2.44	2.10	3.95	3.22	3.81	4.77	2.34	5.44	2.58	1.99	2.99	2.32
7	2.38	1.92	3.58	3.19	3.65	4.44	2.30	4.51	2.46	1.91	3.01	2.32
8	2.19	1.86	3.28	5.67	3.58	4.06	2.16	3.90	2.40	1.91	4.22	2.09
9	2.14	1.88	3.06	5.46	3.88	3.78	2.32	3.58	2.33	2.05	3.67	2.05
10	2.06	1.90	2.96	4.44	4.52	3.70	2.74	3.28	2.26	2.61	3.06	2.42
11	2.02	2.00	2.87	3.84	4.42	3.46	2.53	3.08	2.30	2.17	2.77	2.26
12	1.93	1.97	2.75	3.52	4.10	3.29	2.44	3.02	2.26	2.05	2.57	2.74
13	1.84	1.88	2.72	3.14	3.78	3.38	2.38	3.12	2.34	1.93	2.45	2.33
14	1.80	1.80	3.78	3.66	3.72	3.38	2.35	2.99	2.21	1.87	2.39	2.05
15	1.78	1.78	4.69	4.18	3.70	3.80	2.43	2.85	2.14	1.82	2.77	1.98
16	1.76	1.84	4.09	3.60	3.55	4.28	2.84	2.67	2.05	1.87	2.67	2.08
17	1.75	2.22	3.70	3.25	3.36	4.45	2.65	2.49	1.95	1.90	2.35	1.94
18	1.70	2.24	3.40	3.04	3.17	4.19	2.60	2.48	2.23	1.88	2.69	1.77
19	1.67	2.14	3.20	2.84	2.98	3.83	2.63	2.44	2.25	1.79	2.77	1.69
20	1.68	2.43	3.11	2.96	2.92	3.52	2.55	2.38	2.34	1.85	2.41	1.65
21	1.69	3.32	2.82	3.21	2.75	3.32	2.47	2.32	2.09	1.79	2.21	2.73
22	1.68	4.00	2.90	5.20	3.00	3.30	2.38	2.27	1.91	1.79	2.12	4.91
23	1.67	4.32	4.87	7.53	2.91	3.13	2.42	2.26	1.85	1.73	2.01	3.69
24	1.63	4.09	5.20	5.79	2.85	2.99	2.64	3.30	1.87	1.67	1.93	2.73
25	1.67	4.02	4.09	4.51	2.82	2.98	2.51	5.42	2.02	1.63	1.91	2.71
26	1.68	4.00	3.67	3.84	2.76	2.96	2.40	6.50	5.13	1.61	1.87	3.63
27	1.79	3.72	3.44	3.42	2.78	2.80	2.30	4.63	3.78	1.61	1.81	3.03
28	1.90	3.48	3.38	3.23	3.46	2.72	2.46	3.97	2.81	1.59	1.85	3.03
29	2.10	3.34	3.08	3.06	------	2.68	2.70	3.78	2.81	1.59	1.87	2.59
30	1.93	3.22	2.98	3.20	------	2.62	2.68	4.72	3.12	1.91	1.75	2.40
31	1.77	------	2.86	4.28	------	2.56	------	4.06	------	2.17	1.72	------

OHIO BASIN—STATION NO. 24

CASSELMAN RIVER AT MARKLETON

Location.—At two-span steel highway bridge, Markleton, Somerset County.

Drainage Area.—365 square miles.

Records Available.—August 13, 1913, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by N. B. Sanner.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Control is a 6 inch water main, backed with gravel and boulders, about 250 feet below gage, at the head of a series of riffles; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 7.5 feet at 1 p. m. March 3 (discharge, about 8,760 second-feet); minimum, 2.05 feet at 8 a. m. November 14 (discharge, 60 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined below 2,500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Casselman River at Markleton, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
14	Apr. 7	J. M. Snavely	2.65	207
15	July 12	H. L. Landis	3.71	893

Daily Mean Gage Height, in feet, of Casselman River at Markleton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.81	2.28	3.98	3.18	3.85	3.50	2.96	3.02	3.36	3.16	2.26	2.24
2	3.51	2.64	4.72	3.68	3.55	4.35	2.93	3.04	3.18	2.98	3.53	2.20
3	2.98	3.12	4.28	3.62	3.43	6.94	2.83	2.99	3.04	2.75	6.25	2.18
4	2.76	2.82	4.08	3.56	3.12	5.97	2.77	3.87	3.02	2.67	4.65	2.58
5	2.65	2.58	3.98	3.56	3.59	4.82	2.71	5.73	2.93	2.58	3.76	3.56
6	2.56	2.48	3.82	3.58	4.12	4.59	2.68	4.88	2.78	2.62	3.38	2.92
7	2.53	2.46	3.56	3.45	3.77	4.49	2.66	4.32	2.7[illegible]	2.56	3.48	2.85
8	2.51	2.39	3.44	5.39	3.71	4.17	2.62	4.05	2.72	2.49	3.80	2.61
9	2.49	2.39	3.28	4.62	3.88	4.11	3.06	3.74	2.67	3.08	3.22	2.77
10	2.44	2.39	3.21	4.10	4.01	4.06	3.26	3.52	2.60	3.34	2.95	4.16
11	2.41	2.38	3.19	3.78	4.17	3.75	3.06	3.37	2.53	3.27	2.81	4.02
12	2.38	2.30	3.03	3.30	4.00	3.61	2.96	3.37	2.65	3.66	2.86	3.74
13	2.36	2.16	3.22	3.18	3.78	3.99	2.91	3.62	2.7[illegible]	3.02	2.95	3.25
14	2.31	2.08	3.98	3.51	3.88	3.70	2.87	3.48	2.50	2.78	2.74	2.98
15	2.26	2.28	4.42	3.46	3.8[illegible]	4.13	2.95	3.24	2.38	3.04	2.72	2.82
16	2.24	2.30	3.95	3.28	3.66	4.35	3.25	3.15	2.30	3.44	2.64	2.82
17	2.24	2.44	3.65	3.10	3.55	4.22	3.14	3.04	2.37	2.89	2.61	2.68
18	2.22	2.72	3.52	2.95	3.35	4.05	2.98	3.09	2.84	2.64	3.27	2.77
19	2.20	2.75	3.35	2.85	3.25	3.82	2.94	2.92	2.65	2.59	2.95	2.58
20	2.22	3.18	3.25	3.03	3.05	3.63	2.87	2.86	2.44	2.68	2.70	2.50
21	2.22	4.02	2.99	3.96	2.99	3.52	2.82	2.80	2.28	2.52	2.57	4.08
22	2.21	4.35	3.56	5.75	3.29	3.46	2.78	2.74	2.24	2.40	2.46	5.18
23	2.20	4.42	4.62	6.20	3.19	3.32	2.82	2.83	2.2[illegible]	2.31	2.40	3.98
24	2.20	4.15	4.45	4.88	3.05	3.22	2.84	4.58	2.34	2.2[illegible]	2.36	3.48
25	2.18	4.25	3.83	4.15	2.94	3.25	2.74	4.68	2.31	2.21	2.32	3.62
26	2.22	4.11	3.51	3.75	3.02	3.17	2.68	4.35	5.27	2.40	2.28	4.20
27	2.31	3.83	3.58	3.54	3.13	3.17	2.70	3.72	3.8[illegible]	2.39	2.24	3.60
28	2.53	3.70	3.43	3.43	3.55	3.05	2.70	3.46	3.28	2.25	2.20	3.42
29	2.60	3.50	3.06	3.44	------	2.92	2.88	3.42	3.78	2.23	2.20	3.22
30	2.42	3.41	3.20	3.82	------	2.91	3.15	4.25	3.68	2.46	2.19	2.12
31	2.34	------	3.21	4.55	------	2.87	------	3.72	------	2.39	2.20	------

Daily discharge, in second-feet, of Casselman River at Markleton, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	978	107	1,170	485	1,920	711	546	366	594	453	102	98
2	556	210	1,990	885	753	1,600	331	394	486	356	753	88
3	356	421	1,480	796	671	6,870	281	361	394	251	4,930	84
4	255	280	1,270	594	631	4,420	259	1,020	366	220	1,850	190
5	214	190	1,170	594	796	2,130	235	3,730	331	190	932	753
6	184	160	978	796	1,270	1,850	224	2,270	263	203	631	326
7	175	138	753	671	932	1,720	217	1,480	243	184	711	294
8	169	135	671	3,130	886	1,370	203	1,170	239	163	978	200
9	163	135	556	1,850	1,070	1,270	394	932	220	421	486	259
10	149	135	486	1,270	1,170	1,270	521	711	196	594	341	1,370
11	141	133	486	978	1,370	932	394	594	175	521	276	1,170
12	133	112	394	556	1,170	796	346	591	214	811	208	932
13	128	80	486	711	978	1,170	321	796	239	366	341	521
14	115	65	1,170	711	1,070	886	302	711	166	263	247	356
15	102	107	1.600	671	978	1,270	341	521	133	394	239	280
16	98	112	1,120	556	841	1,600	521	453	128	671	210	280
17	98	149	841	421	753	1,370	453	394	130	312	200	224
18	93	239	711	341	594	1,170	356	366	289	210	521	259
19	88	251	594	294	521	978	336	326	206	190	341	190
20	93	486	521	394	394	841	302	298	149	224	231	166
21	93	1,170	316	1,120	361	711	280	271	107	172	187	1,270
22	90	1,600	753	3,950	556	671	263	247	98	138	155	2,7 0
23	88	1,600	1,850	4,930	486	556	280	284	93	115	138	1,170
24	88	1,270	1,600	2,270	394	486	289	1,850	122	98	128	711
25	84	1,370	1,020	1,370	326	521	247	1,990	115	90	117	796
26	93	1,270	711	932	366	453	224	1.600	2,770	138	107	1,370
27	115	1,020	796	753	453	453	231	886	1,070	133	98	796
28	175	886	671	671	753	394	231	671	556	93	88	631
29	196	711	294	671	------	326	307	631	978	95	88	486
30	144	631	486	978	------	321	453	1.370	886	155	86	421
31	122	------	486	1,850	------	302	------	886	------	135	88	------

Monthly discharge of Casselman River at Markleton, for the year ending Sept. 30, 1921

(Drainage area 365 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	978	84	180	0.493	0.57
November	1,600	65	506	1.39	1.55
December	1,990	316	888	2.43	2.80
January	4,930	294	1,170	3.21	3.70
February	1,370	336	770	2.11	2.20
March	6,870	302	1,270	3.48	4.01
April	521	203	316	.866	.97
May	3,730	247	909	2.49	2.87
June	2,770	93	399	1.09	1.22
July	841	90	271	.742	.86
August	4,930	86	513	1.41	1.63
September	2,770	84	615	1.68	1.87
The year	6,870	65	652	1.79	24.25

OHIO BASIN—STATION NO. 25

LAUREL HILL CREEK AT URSINA

Location.—At two-span steel highway bridge, Ursina, Somerset County.

Drainage Area.—122 square miles.

Records Available.—August 12, 1913, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Miss Lizzie R. Case.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and boulders. Control is at a riffle, where the bed is composed of gravel and boulders, a short distance below the gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 6.1 feet at 4 a. m. January 23 (discharge, about 4,000 second-feet); minimum, 1.65 feet at 5 p. m. July 28 (discharge, 8.3 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 2,400 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Laurel Hill Creek at Ursina, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
15	Apr. 7	J. M. Snavely	2.17	114
16	July 12	J. M. Snavely	2.26	140

Daily Mean Gage Height, in feet, of Laurel Hill Creek at Ursina, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.84	1.95	2.95	2.13	2.90	2.49	2.22	2.64	2.69	2.40	1.82	1.90
2	2.36	1.96	3.38	2.52	2.76	2.63	2.18	2.50	2.46	2.29	2.40	1.84
3	2.27	2.56	3.25	2.55	2.70	4.94	2.18	2.47	2.40	2.16	3.56	1.92
4	2.17	2.18	2.90	2.28	2.70	3.94	2.17	2.84	2.25	2.00	2.90	2.53
5	2.14	2.12	2.90	2.39	3.44	3.44	2.16	3.50	2.20	1.80	2.56	2.66
6	2.09	2.06	2.90	2.28	3.66	3.08	2.12	3.72	2.20	1.92	2.41	2.22
7	2.16	2.20	2.75	2.50	2.69	3.37	2.12	3.05	2.16	1.96	2.52	2.12
8	1.96	1.98	2.47	4.95	2.62	3.22	2.14	2.71	2.12	2.08	2.51	2.04
9	1.99	2.08	2.34	3.98	2.88	3.02	2.18	2.52	2.09	2.20	2.30	2.42
10	1.92	2.00	2.41	3.15	2.85	3.03	2.26	2.40	1.98	2.08	2.16	2.66
11	1.92	1.91	2.37	2.73	2.95	2.77	2.30	2.35	2.00	1.96	2.09	2.85
12	1.92	1.81	2.26	2.67	2.79	2.79	2.39	2.38	2.18	2.04	2.26	2.56
13	1.91	1.78	2.32	2.53	2.57	3.12	2.29	2.36	2.06	2.21	2.19	2.35
14	1.87	2.00	3.11	2.80	2.53	3.07	2.22	2.26	1.88	1.95	2.08	2.21
15	1.88	2.01	3.22	2.79	2.78	3.32	2.23	2.20	1.90	2.10	2.08	2.20
16	1.92	2.08	2.72	2.47	2.69	3.26	2.22	2.16	1.80	2.34	1.98	2.07
17	1.90	2.14	2.62	2.39	2.53	3.30	2.20	2.10	1.90	2.10	1.84	2.02
18	1.88	2.20	2.59	2.41	2.52	3.06	2.20	2.15	2.16	1.94	2.78	2.29
19	1.88	2.25	2.60	2.34	2.46	2.84	2.20	2.08	-------	1.96	2.56	2.30
20	1.82	2.65	2.46	2.43	2.41	2.71	2.12	2.04	-------	2.09	2.18	2.52
21	1.84	3.15	2.23	2.50	2.34	2.56	2.12	2.02	-------	2.00	2.11	3.23
22	1.80	3.25	2.56	4.08	2.34	2.48	2.11	2.00	-------	1.90	2.05	3.62
23	1.77	3.22	3.15	5.23	2.31	2.40	2.08	2.08	-------	1.86	2.06	2.92
24	1.80	3.11	2.99	3.97	2.29	2.21	2.16	2.43	-------	1.80	2.01	2.56
25	1.84	3.35	-------	3.27	2.33	2.24	2.11	3.58	-------	1.73	1.98	2.66
26	1.98	3.15	2.44	2.79	2.37	2.18	2.06	2.82	-------	1.80	1.98	3.10
27	2.00	2.85	2.50	2.69	2.27	2.27	2.08	2.47	3.45	1.70	1.92	2.72
28	1.75	2.63	2.30	2.55	2.37	2.26	2.08	2.39	2.85	1.66	1.85	2.56
29	1.80	2.60	2.41	2.49	-------	2.18	2.30	2.45	2.80	1.94	1.90	2.44
30	1.94	2.55	2.31	2.60	-------	2.16	2.44	3.75	2.44	2.10	1.90	2.46
31	1.97	-------	2.86	2.81	-------	2.09	-------	3.21	-------	1.94	1.88	-------

NOTE.—Gage height Dec. 25 not observed; June 19-26 was lost.

Daily discharge, in second-feet, of Laurel Hill Creek at Ursina, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	446	50	518	94	485	240	122	324	354	195	28	40
2	177	52	825	256	396	318	109	245	225	146	195	31
3	140	278	720	272	360	1,840	109	230	195	103	940	44
4	106	109	485	143	360	1,300	106	446	132	60	485	262
5	97	91	485	190	862	862	103	900	115	25	278	336
6	82	78	485	143	1,020	615	91	1,070	115	44	200	122
7	103	115	390	245	354	790	91	582	103	52	256	91
8	52	56	230	2,440	312	685	97	366	91	80	250	70
9	58	80	168	1,340	472	550	109	256	82	115	150	205
10	44	60	200	650	452	582	136	195	56	80	103	336
11	44	42	182	378	518	402	150	172	60	59	82	452
12	44	26	136	342	414	414	190	186	109	70	136	278
13	42	22	159	262	284	615	146	177	75	118	112	172
14	37	60	615	420	262	582	122	136	37	50	80	118
15	38	62	685	414	408	755	126	115	40	85	80	115
16	44	80	372	230	354	720	122	103	25	168	56	78
17	40	97	312	190	262	755	115	85	40	85	31	65
18	37	115	294	200	256	582	115	100	103	48	408	146
19	37	132	300	168	225	446	115	80	60	52	278	150
20	28	330	225	210	200	366	91	70	30	82	109	256
21	31	650	126	245	168	278	91	65	26	60	88	720
22	25	720	278	1,430	168	235	88	60	20	40	72	980
23	21	685	650	2,700	154	195	80	80	18	34	75	498
24	25	615	544	1,300	146	118	103	210	30	25	62	278
25	31	790	320	720	164	129	88	980	26	16	56	336
26	56	650	215	414	182	109	75	433	1,000	25	56	615
27	60	452	245	354	140	140	80	230	862	12	44	372
28	18	318	150	272	182	136	80	190	452	9.0	3	278
29	25	300	200	240	-------	109	150	220	420	48	40	215
30	48	272	154	300	-------	103	215	1,120	215	85	40	225
31	54	-------	459	426	-------	82	-------	685	-------	48	37	-------

NOTE.—Discharge Dec. 25 and June 19-26 estimated, because of no gage height record, from discharge of the Casselman River at Markleton.

Monthly discharge of Laurel Hill Creek at Ursina, for the year ending Sept. 30, 1921

(Drainage area 122 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	446	18	67.4	0.552	0.64
November	790	22	246	2.02	2.25
December	825	126	359	2.94	3.39
January	2,700	94	548	4.49	5.18
February	1,020	140	341	2.79	2.90
March	1,840	82	486	3.98	4.59
April	215	75	114	.934	1.04
May	1,120	60	326	2.67	3.08
June	1,000	18	171	1.40	1.56
July	195	9.0	68.1	.558	.64
August	940	28	157	1.29	1.49
September	980	31	263	2.16	2.41
The year	2,700	9.0	262	2.15	29.17

OHIO BASIN—STATION NO. 26

YOUGHIOGHENY RIVER AT CONNELLSVILLE

Location.—At two-span steel highway bridge between New Haven and Connellsville, Fayette County.

Drainage Area.—1,320 square miles.

Records Available.—July 22, 1908, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Peter M. Rulli. Elevation of gage zero 860.13, feet United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and rocks. Control is at a riffle about 500 feet below gage where bed is rock formation; permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 10.1 feet at 11 a. m. March 3 (discharge, 22,400 second-feet): minimum, 0.90 foot at 5 p. m. September 3 (discharge, 220 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined below 1,000 second-feet and well defined from 1,000 to 30,000 second-feet. Gage read to half tenths twice daily until March 31; to hundredths twice daily from April 1 to September 30. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

The following discharge measurement was made by H. L. Landis: No. 33, July 11: Gage height 2.22 feet; discharge, 1,240 second-feet.

Daily Mean Gage Height, in feet, of Youghiogheny River at Connellsville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.61	1.15	3.33	2.60	4.78	3.45	2.45	3.01	3.60	2.94	1.38	1.04
2	3.42	1.20	4.82	3.15	4.10	4.18	2.50	2.94	3.15	2.25	2.00	1.03
3	2.70	1.88	4.08	3.72	3.75	9.03	2.38	2.82	2.85	2.02	6.25	.92
4	2.30	2.18	4.38	3.32	3.38	8.40	2.22	3.35	2.62	1.85	6.16	.97
5	2.05	1.78	4.18	3.08	3.50	6.25	2.12	6.77	2.42	1.59	4.00	2.09
6	1.85	1.52	4.05	3.15	4.45	5.25	2.06	6.25	2.16	1.50	2.99	2.26
7	1.75	1.35	3.65	2.98	4.20	5.20	1.95	5.15	2.00	1.50	2.65	2.30
8	1.60	1.30	3.30	6.92	3.85	4.88	1.87	4.48	1.92	1.30	3.64	1.80
9	1.50	1.28	3.02	6.62	3.92	4.48	2.31	3.89	1.82	1.90	3.32	1.55
10	1.40	1.28	2.78	5.15	4.62	4.68	3.02	3.44	1.74	2.30	2.62	1.97
11	1.32	1.30	2.72	4.32	4.68	4.20	2.84	3.12	1.64	2.15	2.22	3.15
12	1.35	1.32	2.55	3.85	4.50	3.80	2.64	2.98	1.64	2.18	2.11	3.26
13	1.25	1.25	2.55	3.28	4.08	4.15	2.52	3.08	1.82	2.26	2.28	2.62
14	1.20	1.22	3.30	4.00	4.00	3.92	2.42	2.95	1.64	1.66	2.05	2.12
15	1.12	1.10	5.24	4.60	4.02	4.15	2.42	2.72	1.44	1.50	1.90	1.85
16	1.12	1.42	4.40	3.95	3.72	4.90	2.68	2.48	1.36	2.11	2.16	1.86
17	1.02	2.25	3.90	3.40	3.52	5.22	2.60	2.25	1.28	1.95	2.02	1.74
18	1.08	2.10	3.50	2.78	3.20	4.68	2.45	2.19	1.54	1.62	3.20	1.68
19	1.02	2.10	3.08	2.40	2.90	4.22	2.40	2.09	1.80	1.46	2.90	1.64
20	1.02	2.62	2.78	2.72	2.70	3.80	2.32	1.98	1.58	1.41	2.21	1.44
21	1.00	3.60	2.50	3.18	2.20	3.50	2.20	1.80	1.42	1.44	1.92	2.85
22	1.05	4.58	2.62	5.52	2.85	3.32	2.11	1.81	1.20	1.31	1.68	6.22
23	1.00	4.95	4.98	8.06	2.85	3.08	2.15	1.82	1.12	1.24	1.47	4.34
24	.95	4.55	5.72	6.80	2.75	2.85	2.29	3.97	1.28	1.06	1.42	3.18
25	1.05	4.52	4.40	5.25	2.45	2.82	2.22	5.68	1.34	1.04	1.35	3.03
26	1.00	4.72	3.68	4.22	2.28	2.78	2.08	7.10	5.36	.99	1.26	4.40
27	1.05	4.20	3.52	3.68	2.62	2.70	1.96	4.88	5.22	1.01	1.20	3.62
28	1.10	3.72	3.45	3.35	3.55	2.58	2.15	3.86	3.24	1.06	1.12	3.10
29	1.45	3.45	2.88	3.20	-------	2.48	2.48	3.57	3.14	1.10	1.14	2.74
30	1.45	3.28	2.80	3.40	-------	2.35	2.86	5.22	3.31	1.54	1.10	2.44
31	1.28	-------	2.75	5.42	-------	2.28	-------	4.56	-------	1.44	1.04	-------

Daily discharge, in second-feet, of Youghiogheny River at Connellsville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,070	352	2,600	1,610	5,320	2,750	1,430	2,150	3,070	2,010	500	298
2	2,750	380	5,320	2,450	3,920	4,100	1,490	2,010	2,450	1,200	960	298
3	1,740	870	5,770	3,230	3,400	18,400	1,370	1,870	1,870	960	8,900	230
4	1,260	1,150	4,480	2,600	2,750	16,200	1,150	2,750	1,610	830	8,900	255
5	1,000	790	4,100	2,300	2,910	8,900	1,050	10,800	1,370	640	3,740	1,050
6	830	570	3,740	2,450	4,480	6,230	1,000	8,900	1,100	570	2,150	1,200
7	750	470	3,070	2,150	4,100	6,230	915	6,230	960	570	1,610	1,200
8	640	440	2,600	11,100	3,400	5,540	830	4,680	870	440	3,070	790
9	570	440	2,150	10,100	3,570	4,680	1,260	3,570	790	870	2,600	605
10	500	440	1,870	6,230	4,800	5,100	2,150	2,750	750	1,260	1,610	915
11	440	440	1,740	4,200	5,100	4,100	1,870	2,300	675	1,100	1,150	2,450
12	470	440	1,610	3,400	4,680	3,400	1,610	2,150	675	1,150	1,050	2,600
13	410	410	1,610	2,600	3,920	4,100	1,490	2,300	790	1,200	1,200	1,610
14	380	380	2,600	3,740	3,740	3,570	1,370	2,150	675	675	1,000	1,050
15	325	325	6,230	4,890	3,740	4,100	1,370	1,740	535	570	870	830
16	325	500	4,480	3,740	3,230	5,540	1,740	1,490	470	1,050	1,100	830
17	270	1,200	3,570	2,750	2,910	6,230	1,610	1,200	440	915	960	750
18	325	1,050	2,910	1,870	2,450	5,100	1,430	1,150	605	640	2,450	710
19	270	1,050	2,300	1,370	2,010	4,100	1,370	1,050	790	535	2,010	675
20	270	1,610	1,870	1,740	1,740	3,400	1,260	960	640	500	1,150	535
21	270	3,070	1,490	2,450	1,150	2,910	1,150	870	500	535	870	1,870
22	298	4,890	1,610	6,970	1,870	2,600	1,050	790	380	440	710	8,900
23	270	5,770	5,770	17,200	1,870	2,300	1,100	790	325	410	535	4,200
24	245	4,890	7,500	10,800	1,870	1,870	1,260	3,740	440	298	500	2,450
25	298	4,680	4,480	6,230	1,430	1,870	1,150	7,500	470	298	470	2,150
26	270	5,100	3,230	4,100	1,260	1,870	1,050	11,800	6,720	265	410	4,480
27	298	4,100	2,910	3,230	1,610	1,740	915	5,540	6,230	270	380	3,070
28	325	3,230	2,750	2,750	3,070	1,610	1,100	3,570	2,450	298	325	2,300
29	535	2,750	2,010	2,450	-------	1,490	1,490	3,070	2,300	325	352	1,740
30	535	2,600	1,870	2,750	-------	1,320	2,010	6,230	2,600	605	325	1,430
31	440	-------	1,870	6,720	-------	1,260	-------	4,890	-------	535	298	-------

Monthly discharge of Youghiogheny River at Connellsville, for the year ending Sept. 30, 1921

(Drainage area 1,320 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	3,070	245	657	0.498	0.57
November	5,770	325	1,810	1.37	1.53
December	7,500	1,490	3,230	2.45	2.82
January	17,300	1,370	4,530	3.43	3.95
February	5,320	1,150	3,080	2.33	2.43
March	18,400	1,260	4,600	3.48	4.01
April	2,150	830	1,330	1.01	1.13
May	11,800	790	3,580	2.71	3.12
June	6,720	325	1,450	1.10	1.23
July	2,010	265	709	.537	.62
August	8,900	298	1,680	1.27	1.46
September	8,900	230	1,720	1.30	1.45
The year	18,400	230	2,370	1.80	24.32

OHIO BASIN—STATION NO. 27

YOUGHIOGHENY RIVER AT SUTERSVILLE

Location.—At three-span steel highway bridge, Sutersville, Westmoreland County.

Drainage Area.—1,680 square miles.

Records Available.—June 11, 1915, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Archie W. McGrew. Elevation of gage zero 733.14 feet, United State Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge.

Channel and Control.—Right bank is low and subject to overflow; left is high and does not overflow. Bed is composed of shifting sand and gravel overlaying a rocky bed. Control is at a riffle. about 400 feet below gage at right side of stream; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 12.8 feet at 8 p. m. March 3 (discharge, 22,000 second-feet); minimum, 2.80 feet at 5 p. m. October 30 (discharge, 330 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined between 400 and 40,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Cooperation.—Station is maintained in cooperation with United States Engineer Office, Pittsburgh.

Discharge Measurements of Youghiogheny River at Sutersville, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
14	Apr. 8	J. M. Snavely	3.92	1,230
15	July 11	J. M. Snavely	4.11	1,520

Daily Mean Gage Height, in feet, of Youghiogheny River at Sutersville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.70	2.82	5.62	4.54	7.26	5.66	------	4.88	5.35	5.50	3.04	3.12
2	5.74	2.84	6.48	5.51	6.37	5.92	------	4.91	5.02	4.96	3.32	2.98
3	4.90	3.31	6.88	5.58	5.84	10.80	4.29	4.79	4.70	4.52	6.89	2.95
4	4.43	4.20	6.24	5.33	5.54	11.26	4.24	4.90	4.47	3.99	8.01	2.92
5	4.08	3.98	5.96	5.04	5.52	8.61	4.19	7.88	4.26	3.57	6.40	3.98
6	3.82	3.52	5.89	4.89	6.35	7.38	4.14	8.85	4.03	3.39	5.19	4.28
7	3.68	3.37	5.66	4.86	6.40	7.84	4.10	7.20	3.85	3.28	4.59	4.50
8	3.54	3.26	5.40	7.92	6.11	7.32	4.00	6.40	3.69	3.16	5.00	3.91
9	3.44	3.18	5.20	9.42	6.15	6.80	4.05	5.79	3.59	3.98	5.22	3.52
10	3.36	3.18	5.00	7.65	6.50	7.00	4.86	5.42	3.52	4.32	4.60	4.85
11	3.31	3.19	4.75	6.65	6.98	6.55	4.84	5.09	3.48	4.15	4.15	5.32
12	3.26	3.11	4.54	5.85	6.74	6.98	4.64	4.86	3.44	4.44	3.60	5.15
13	3.20	3.09	4.45	5.28	6.32	6.12	4.54	4.80	3.40	4.36	3.72	4.76
14	3.14	3.02	4.64	5.95	6.06	6.08	4.44	4.69	3.35	3.72	3.91	4.10
15	3.11	2.98	6.58	6.90	5.90	5.96	4.36	4.58	3.29	3.50	3.82	3.77
16	3.08	3.00	6.45	6.30	5.70	6.47	4.29	4.44	3.24	4.15	3.63	3.67
17	3.04	4.32	5.71	5.56	5.50	6.88	4.40	4.30	3.22	4.22	3.88	3.64
18	3.00	4.30	5.36	4.99	5.36	6.69	4.45	4.12	3.46	4.00	5.02	3.60
19	2.98	4.02	5.09	4.70	5.18	6.32	4.27	3.96	3.46	4.06	4.95	3.52
20	2.95	4.20	4.72	4.54	4.78	5.90	4.18	3.88	3.38	3.88	4.38	3.40
21	2.92	5.10	4.50	4.70	4.56	5.60	4.10	3.78	3.32	3.72	3.88	4.20
22	2.90	6.00	4.38	6.65	4.65	5.28	4.04	3.68	3.26	3.56	3.52	7.88
23	2.86	6.65	6.06	11.26	4.67	5.18	3.99	3.60	3.20	3.42	3.42	6.50
24	2.86	6.84	7.53	9.45	4.54	4.94	3.96	4.68	3.14	3.27	3.34	5.30
25	2.84	6.64	6.38	7.40	4.46	4.84	3.92	6.78	3.08	3.16	3.24	4.92
26	2.84	6.40	5.58	6.38	4.46	4.76	3.90	8.58	6.77	3.07	3.18	6.48
27	2.82	6.10	5.40	5.82	4.58	4.68	3.86	6.65	7.25	3.00	3.13	5.62
28	2.82	5.70	5.42	5.52	4.69	4.61	3.92	5.65	6.15	2.94	3.08	5.11
29	2.81	5.47	5.04	5.18	------	4.52	4.08	5.20	5.45	2.92	3.04	4.80
30	2.80	5.26	4.78	5.60	------	4.42	4.55	6.20	5.30	3.25	2.99	4.54
31	2.81	------	4.60	7.62	------	------	------	6.45	------	3.22	3.10	------

NOTE—Gage height Mar, 31 to Apr. 2 not observed.

Daily discharge, in second-feet, of Youghiogheny River at Sutersville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,810	330	3,630	1,950	7,060	3,810	1,800	2,490	3,270	3,450	485	520
2	3,810	360	5,400	3,450	5,200	4,200	1,800	2,490	2,640	2,640	680	450
3	2,490	680	6,200	3,630	4,000	15,800	1,700	2,350	2,210	1,950	6,200	420
4	1,820	1,580	4,800	3,160	3,450	17,300	1,580	2,490	1,950	1,350	8,600	390
5	1,460	1,350	4,400	2,640	3,150	10,000	1,580	8,380	1,700	895	5,200	1,350
6	1,140	850	4,200	2,490	5,200	7,280	1,460	10,500	1,350	76	2,940	1,700
7	1,040	720	3,810	2,490	5,200	8,160	1,460	6,840	1,190	680	2,080	1,950
8	805	640	3,270	8,380	4,600	7,060	1,350	5,200	1,040	560	2,640	1,240
9	805	600	2,940	12,000	4,800	6,000	1,350	4,000	940	1,350	2,940	850
10	720	600	2,640	7,720	5,400	6,400	2,490	3,270	850	1,700	2,080	2,350
11	680	600	2,350	5,600	6,400	5,600	2,350	2,790	850	1,580	1,580	3,100
12	640	560	1,950	4,000	5,800	4,600	2,080	2,490	805	1,820	940	2,940
13	600	520	1,820	3,100	5,000	4,600	1,950	2,350	760	1,820	1,040	2,350
14	560	450	2,080	4,400	4,600	4,600	1,820	2,210	720	1,040	1,240	1,460
15	520	450	5,600	6,200	4,200	4,400	1,820	2,080	680	850	1,140	1,090
16	520	450	5,200	5,000	3,810	5,400	1,700	1,820	640	1,580	990	990
17	485	1,700	3,810	3,630	3,450	6,200	1,820	1,700	600	1,580	1,240	990
18	450	1,700	3,270	2,640	3,270	5,800	1,820	1,460	805	1,460	2,640	940
19	450	1,350	2,790	2,210	2,940	5,000	1,700	1,290	805	1,460	2,640	850
20	420	1,580	2,210	1,950	2,350	4,200	1,580	1,240	760	1,240	1,820	805
21	390	2,790	1,950	2,210	2,080	3,630	1,460	1,140	680	1,040	1,240	1,580
22	390	4,400	1,820	5,600	2,080	3,270	1,350	1,040	640	895	850	8,380
23	360	5,600	4,600	17,300	2,210	2,940	1,350	940	600	760	760	5,400
24	360	6,000	7,500	12,000	1,950	2,490	1,290	2,210	560	640	720	3,100
25	360	5,600	5,200	7,280	1,950	2,350	1,240	6,000	520	560	640	2,490
26	360	5,200	3,630	5,200	1,950	2,350	1,240	10,000	6,000	485	600	5,400
27	330	4,600	3,270	4,000	2,080	2,210	1,190	5,600	6,840	450	560	3,630
28	330	3,810	3,270	3,450	2,210	2,080	1,240	3,630	4,800	420	520	2,790
29	330	3,450	2,640	2,940	-------	1,950	1,460	2,940	3,270	420	485	2,350
30	330	3,100	2,350	3,630	-------	1,820	2,080	4,800	3,100	640	450	1,950
31	330	-------	2,080	7,720	-------	1,700	-------	5,200	-------	600	520	-------

NOTE—Discharge Mar. 31 to Apr. 2 estimated, because of no gage height record, from discharge of Youghiogheny River at Connellsville.

Monthly discharge of Youghiogheny River at Sutersville, for the year ending Sept. 30, 1921
(Drainage area 1,680 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	3,810	330	877	0.522	0.60
November	6,000	330	2,050	1.22	1.36
December	7,500	1,820	3,570	2.12	2.44
January	17,300	1,950	5,090	3.03	3.49
February	7,060	1,950	3,810	2.27	2.36
March	17,300	1,700	5,260	3.13	3.61
April	2,490	1,190	1,640	.976	1.09
May	10,500	940	3,580	2.13	2.46
June	6,840	520	1,720	1.02	1.14
July	3,450	420	1,180	.702	.81
August	8,600	450	1,820	1.08	1.24
September	8,380	390	2,130	1.27	1.42
The year	17,300	330	2,730	1.62	22.02

OHIO BASIN—STATION NO. 28

TURTLE CREEK NEAR TRAFFORD

Location.—At single-span steel highway bridge, Blackburn Station, Pennsylvania Railroad, about one and a quarter miles northeast of Trafford, Westmoreland County.

Drainage Area.—55 square miles.

Records Available.—July 28, 1914, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by S. T. Churchfield.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of hardpan and gravel; practically permanent. Control is at a riffle about 50 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 3.20 feet observed at 5.30 p. m. March 6 (discharge, about 940 second-feet); minimum, 0.48 foot from 5.30 p. m. October 24 to 6.45 a. m. October 25 (discharge, 2.6 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 300 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for high stages when they are fair.

Discharge Measurements of Turtle Creek near Trafford, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
21	Apr. 10	J. M. Snavely	1.20	53.8
22	10	J. M. Snavely	1.20	53.7
23	11	J. M. Snavely	1.17	50.4
24	July 10*	H. L. Landis	.94	22.4

* Measurement made by wading 300 feet below gage.

Daily Mean Gage Height, in feet, of Turtle Creek near Trafford, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.65	0.66	1.42	0.90	1.80	1.78	1.41	1.37	0.86	1.95	0.86	0.58
2	1.35	.86	1.61	1.20	1.57	1.68	1.33	1.27	.84	1.83	.88	.56
3	1.15	.97	1.52	1.12	1.47	1.74	1.27	1.14	.82	1.70	.93	.56
4	.99	.93	1.42	1.03	1.43	1.72	1.23	1.19	.80	1.30	.92	.88
5	.93	.90	1.40	.97	1.39	1.68	1.19	1.65	.78	1.05	.90	.98
6	.85	.88	1.35	.93	1.44	2.95	1.15	1.62	.76	.93	.88	.98
7	.82	.90	1.31	1.55	1.56	2.75	1.11	1.53	.74	.87	1.00	.97
8	.80	.94	1.27	2.35	1.65	2.56	1.07	1.41	.72	.87	1.13	.93
9	.78	.97	1.23	1.85	1.67	2.65	1.25	1.29	.70	1.09	1.02	.95
10	.76	.95	1.22	1.65	1.80	2.65	1.25	1.18	.68	1.02	.93	1.15
11	.73	.92	1.22	1.55	1.99	2.45	1.20	1.10	.66	.94	.88	1.15
12	.70	.90	1.18	1.51	1.93	2.10	1.15	1.05	.69	.98	.93	1.09
13	.68	.88	1.10	1.53	1.69	2.05	1.11	1.01	.68	.97	.93	1.05
14	.66	.97	1.05	1.96	1.62	1.80	1.07	.97	.66	.93	1.02	.97
15	.64	1.01	1.01	1.89	1.57	1.55	1.03	.93	.64	.91	1.07	.94
16	.62	1.05	.97	1.83	1.45	1.43	.99	.90	.62	.90	1.03	.91
17	.60	1.41	.93	1.67	1.39	1.37	1.08	.88	.60	.88	1.04	.87
18	.58	1.45	.90	1.59	1.35	1.32	1.06	.86	.62	.88	1.09	.84
19	.56	1.49	.88	1.49	1.31	1.23	1.01	.84	.60	1.78	1.08	.82
20	.54	1.48	.89	1.51	1.33	1.17	.97	.82	.58	2.25	1.04	.87
21	.52	1.54	.90	1.55	1.37	1.15	.93	.80	.56	1.70	.96	2.52
22	.50	1.76	1.00	1.63	1.41	1.14	.89	.78	.60	1.20	.91	2.76
23	.50	1.98	1.17	2.10	1.45	1.12	.85	.75	1.63	.94	.85	1.68
24	.48	2.08	1.08	1.89	1.40	1.09	.83	.71	1.53	.90	.81	1.26
25	.48	1.99	.98	1.85	1.35	1.07	.84	.81	1.48	.88	.77	1.19
26	.50	1.92	.89	1.79	1.31	1.01	.81	.81	2.38	.86	.73	1.23
27	.54	1.87	1.23	1.75	2.05	.97	.78	.78	2.54	.84	.70	1.31
28	.59	1.76	1.28	1.71	1.95	1.15	.89	.77	2.65	.82	.68	1.27
29	.67	1.57	1.18	1.63	------	1.25	1.14	.88	2.50	.86	.65	1.17
30	.70	1.35	1.07	1.68	------	1.17	1.29	.91	2.15	.90	.62	1.11
31	.68	------	.94	1.95	------	1.16	------	.88	------	.88	.60	------

Daily discharge, in second-feet, of Turtle Creek near Trafford, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	150	5.4	91	18	199	192	89	82	15	258	15	3.9
2	78	15	138	53	127	159	74	64	14	210	17	3.6
3	46	25	114	43	102	179	64	45	12	165	21	3.6
4	27	21	91	32	94	172	58	52	11	69	20	17
5	21	18	87	25	85	159	52	150	9.7	34	18	26
6	14	17	78	21	96	778	46	141	8.7	21	17	26
7	12	18	71	122	125	658	41	117	7.8	16	28	25
8	11	22	64	442	150	546	36	89	7.0	16	44	21
9	9.7	25	58	218	156	601	61	67	6.4	39	30	23
10	8.7	23	56	150	199	601	61	50	5.9	30	21	46
11	7.4	20	56	122	275	493	53	40	5.4	22	17	46
12	6.4	18	50	112	250	323	46	34	6.2	26	21	39
13	5.9	17	40	117	162	301	41	29	5.9	25	21	34
14	5.4	25	34	262	141	199	36	25	5.4	21	30	25
15	5.0	29	29	233	127	122	32	21	5.0	19	36	22
16	4.6	34	25	210	98	94	27	18	4.6	18	32	19
17	4.2	89	21	156	85	82	38	17	4.2	17	33	16
18	3.9	98	18	132	78	73	35	15	4.6	17	39	14
19	3.6	107	17	107	71	58	29	14	4.2	192	38	12
20	3.3	105	17	112	74	49	25	12	3.9	393	33	16
21	3.1	119	18	122	82	46	21	11	3.6	165	24	519
22	2.8	185	28	144	89	45	17	9.7	4.2	53	19	658
23	2.8	271	49	323	98	43	14	8.2	144	22	14	159
24	2.6	323	38	233	87	39	13	6.7	117	18	12	63
25	2.6	275	26	218	78	36	14	12	105	17	9.2	52
26	2.8	245	17	196	71	29	12	12	467	15	7.4	58
27	3.3	226	58	182	301	25	9.7	9.7	546	14	6.4	71
28	4.0	185	66	168	258	46	17	9.2	601	12	5.9	64
29	5.6	127	50	144	------	61	45	17	519	15	5.2	49
30	6.4	78	36	159	------	49	67	19	346	18	4.6	41
31	5.9	------	22	258	------	48	------	17	------	17	4.2	------

Monthly discharge of Turtle Creek near Trafford, for the year ending Sept. 30, 1921

(Drainage area 55 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	150	2.6	15.1	0.275	0.32
November	323	5.4	92.2	1.68	1.87
December	138	17	50.4	.916	1.06
January	442	18	156	2.84	3.27
February	301	71	134	2.44	2.54
March	778	25	203	3.69	4.25
April	89	9.7	39.1	.711	.79
May	150	6.7	39.1	.711	.82
June	601	3.6	100	1.82	2.03
July	393	12	63.7	1.16	1.34
August	44	4.2	20.7	.376	.43
September	658	3.6	72.4	1.32	1.47
The year	778	2.6	81.8	1.49	20.19

OHIO BASIN—STATION NO. 29

CHARTIERS CREEK AT CARNEGIE

Location.—At single-span steel railroad bridge, siding of the Chartiers Branch, Pittsburgh, Cincinnati, Chicago & St. Louis R. R., Carnegie, Allegheny County.

Drainage Area.—260 square miles.

Records Available.—June 5, 1915, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Richard Musiol.

Discharge Measurements.—Made from upstream side of railroad bridge, branch line, about 100 feet above the gage.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of mud and slag over a rocky floor. Control is at the first of a series of riffles about 600 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 11.5 feet at midnight September 21-22 (discharge, about 8,300 second-feet); minimum, 1.50 feet from 3 p. m. July 27 to 3 p. m. July 28 (discharge, 25 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined below 2,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applyinging daily mean gage height to rating table. Results fair.

Cooperation.—Station is maintained in cooperation with United States Engineer Office, Pittsburgh.

Discharge Measurements of Chartiers Creek at Carnegie, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
17	Apr. 10	J. M. Snavely	2.99	276
18	July 10	J. M. Snavely	1.92	62.6

Daily Mean Gage Height, in feet, of Chartiers Creek at Carnegie, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.55	1.65	3.23	2.48	4.25	3.80	3.96	2.93	2.14	1.86	1.86	3.50
2	2.18	1.68	4.09	2.80	3.84	3.80	3.88	2.66	2.03	1.76	2.36	2.23
3	1.86	1.74	3.40	2.84	3.59	4.40	3.48	2.66	2.12	1.69	3.08	2.12
4	1.68	1.76	3.10	2.69	3.42	4.06	3.30	3.04	2.51	1.64	2.62	2.02
5	1.71	1.66	2.86	2.65	3.96	3.86	3.15	3.80	2.15	1.58	2.20	2.45
6	1.69	1.61	2.68	2.60	4.97	4.75	3.03	3.64	1.95	1.58	1.96	2.49
7	1.65	1.62	2.54	3.22	4.48	7.70	2.96	3.25	1.92	1.58	2.21	2.36
8	1.67	1.65	2.42	5.53	4.30	5.42	2.86	2.96	1.90	1.79	2.20	2.23
9	1.66	1.68	2.30	4.19	4.22	4.69	3.19	2.77	1.87	2.44	2.00	2.06
10	1.66	1.68	2.38	3.48	4.79	4.72	3.04	2.70	1.84	1.96	1.92	2.48
11	1.63	1.63	2.38	3.14	6.02	4.15	2.88	2.64	1.85	1.89	1.86	2.46
12	1.60	1.62	2.34	2.94	4.80	3.99	2.79	2.58	1.93	3.49	2.06	2.49
13	1.58	1.56	2.28	2.48	4.34	4.19	2.75	2.52	1.86	2.35	1.94	2.24
14	1.59	1.55	2.46	4.04	3.98	3.92	2.73	2.55	1.79	2.10	2.52	2.12
15	1.59	1.57	3.02	4.26	3.72	3.76	2.68	2.41	1.76	2.28	2.73	2.06
16	1.59	1.79	2.72	3.70	3.63	3.90	2.59	2.32	1.76	3.17	2.32	2.00
17	1.58	2.55	2.60	2.84	3.48	3.66	2.60	2.27	1.76	2.06	2.27	1.96
18	1.58	2.49	2.42	2.60	3.25	3.58	2.52	2.24	1.73	1.84	4.36	2.07
19	1.58	2.32	2.27	2.78	3.17	3.43	2.45	2.22	1.73	1.96	3.15	2.14
20	1.58	2.87	2.10	2.89	3.00	3.32	2.42	2.17	1.86	2.04	2.25	2.28
21	1.59	3.15	1.88	2.94	2.87	3.24	2.35	2.14	1.74	1.92	2.20	6.55
22	1.59	2.82	2.50	3.29	3.11	3.21	2.32	2.10	1.70	1.72	2.12	6.48
23	1.59	2.85	4.07	4.96	3.34	3.11	2.36	2.08	1.70	1.66	2.00	3.55
24	1.59	2.77	3.14	4.19	3.41	3.06	2.38	2.04	1.66	1.60	1.96	2.95
25	1.60	2.59	2.65	3.32	3.10	3.04	2.24	2.98	1.64	1.54	1.98	3.57
26	1.65	2.54	2.62	3.02	3.10	2.95	2.22	2.69	2.25	1.54	2.57	3.56
27	2.10	2.50	2.81	3.02	3.22	2.95	2.22	2.34	2.11	1.50	2.06	3.03
28	2.32	2.38	2.82	2.88	3.65	3.49	2.66	2.27	2.12	1.83	1.92	2.95
29	1.88	2.27	2.36	3.06	-------	3.98	2.76	2.49	2.38	5.20	1.85	2.71
30	1.76	2.32	2.54	5.07	-------	3.41	3.32	2.42	2.08	3.21	1.83	2.85
31	1.72	-------	2.46	5.72	-------	3.64	-------	2.26	-------	2.15	2.78	-------

Daily discharge, in second-feet, of Chartiers Creek at Carnegie, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	170	38	380	156	840	635	710	275	94	59	59	485
2	100	40	785	230	660	635	685	192	79	48	132	108
3	59	46	440	245	535	900	485	192	91	41	325	91
4	40	48	325	205	440	785	400	308	160	37	180	78
5	43	38	245	192	710	660	342	635	96	31	103	150
6	41	34	205	180	1,330	1,200	308	560	69	31	70	158
7	38	35	170	360	1,020	3,470	275	380	65	31	105	132
8	39	38	144	1,680	900	1,610	245	275	63	51	103	108
9	38	40	120	840	840	1,140	360	218	60	150	87	83
10	38	40	136	485	1,200	1,140	308	205	56	70	65	156
11	36	36	136	342	2,050	840	260	192	58	62	59	152
12	33	35	128	275	1,200	735	230	180	67	485	83	158
13	31	30	117	156	900	840	218	160	59	130	68	110
14	32	29	152	735	735	685	218	170	51	88	160	91
15	32	30	290	900	585	610	205	142	48	117	218	83
16	32	51	205	585	560	685	180	124	48	342	124	75
17	31	170	180	245	485	560	180	115	48	83	115	70
18	31	158	144	180	380	535	160	110	45	56	960	84
19	31	124	115	230	342	462	150	106	45	70	342	94
20	31	245	88	260	290	400	144	98	59	80	113	117
21	32	342	61	275	245	380	130	94	46	65	103	2,540
22	32	230	160	400	325	360	124	88	42	44	91	2,450
23	32	245	785	1,330	420	325	132	85	42	38	75	510
24	32	218	342	785	440	308	136	80	38	33	70	275
25	33	180	192	400	325	308	110	290	37	28	73	510
26	38	170	180	290	325	275	106	205	112	28	170	510
27	88	160	230	290	560	275	106	128	90	25	83	308
28	124	136	230	260	560	485	192	115	91	55	65	275
29	61	115	132	308	-------	735	218	158	136	1,470	58	205
30	48	124	170	1,400	-------	440	400	144	85	360	55	245
31	44	-------	152	1,820	-------	560	-------	113	-------	96	230	-------

Monthly discharge of Chartiers Creek at Carnegie, for the year ending Sept. 30, 1921

(Drainage area 260 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	170	31	48.1	0.185	0.21
November	342	29	108	.415	.46
December	785	61	230	.885	1.02
January	1,820	156	517	1.99	2.29
February	2,050	245	679	2.61	2.72
March	3,570	275	746	2.87	3.31
April	710	106	257	.988	1.10
May	635	80	198	.762	.88
June	160	37	69.3	.267	.30
July	1,470	25	139	.535	.62
August	960	55	147	.565	.65
September	2,540	70	347	1.33	1.48
The year	3,570	25	288	1.11	15.04

OHIO BASIN—STATION NO. 30

SHENANGO RIVER NEAR TURNERVILLE

Location.—At single-span steel highway bridge, about one half mile east of Turnerville, Crawford County.

Drainage Area.—152 square miles.

Records Available.—February 1, 1912, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by S. A. Marvin. Elevation of gage zero 970.00 feet, United State Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Right bank is high and not subject to overflow; left begins to overflow at a stage of about 10.7 feet. Bed is composed of silt and gravel. Control is at a clay and boulder riffle about 200 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 10.8 feet at 8 p. m. March 29 (discharge, 1,610 second-feet); minimum, 3.63 feet on August 31 and September 1 (discharge, 4.8 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 1,200 second-feet and fairly well defined between 1,200 and 5,000 second-feet. Gage read to quarter tenths once daily. Daily discharge ascertained by applying daily mean gage height, computed from a continuous daily hydrograph, obtained by plotting chain gage readings, to rating table. Results good.

Daily Mean Gage Height, in feet, of Shenango River, near Turnerville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.95	4.30	5.98	5.06	4.76	5.18	7.98	5.75	5.95	4.05	3.92	3.63
2	4.05	4.40	7.08	6.08	4.78	5.48	7.45	5.90	5.58	3.94	3.95	3.68
3	4.15	4.50	6.98	6.33	4.63	6.68	6.92	5.84	5.20	3.80	4.05	3.68
4	4.22	4.40	7.96	7.08	4.68	6.98	6.29	5.58	4.90	3.75	4.00	3.68
5	4.18	4.40	7.65	7.18	5.03	7.26	5.80	5.32	4.67	3.70	4.10	3.83
6	4.00	4.45	7.48	6.56	6.08	8.45	5.49	5.13	4.44	3.70	4.00	3.78
7	3.90	4.48	7.33	6.05	6.38	9.67	5.36	5.00	4.25	3.70	4.00	3.78
8	3.85	4.45	7.13	6.18	7.08	9.88	5.08	4.86	4.10	3.68	4.23	3.76
9	3.80	4.38	6.63	5.88	8.08	9.08	5.16	4.70	4.02	3.70	4.30	3.70
10	3.80	4.25	6.03	5.60	8.38	8.58	5.25	4.70	4.00	3.70	4.35	3.76
11	3.80	4.18	5.73	5.92	8.08	7.98	5.59	4.60	3.95	3.75	4.35	-------
12	3.78	4.15	5.50	4.96	7.33	7.28	5.70	4.50	3.92	3.78	4.20	-------
13	3.75	4.10	5.36	4.98	6.88	6.93	5.56	4.40	3.90	3.98	4.10	-------
14	3.75	4.02	5.80	4.98	6.48	6.58	5.40	4.30	3.90	4.05	4.18	-------
15	3.75	3.98	5.78	4.76	6.23	6.48	5.38	4.20	3.90	4.20	4.08	-------
16	3.72	3.98	5.78	4.68	6.50	6.38	5.70	4.20	3.80	4.30	3.95	-------
17	3.70	3.98	5.78	4.65	7.48	6.13	6.28	4.15	3.80	4.24	3.95	4.21
18	3.70	4.05	5.53	4.58	8.63	6.18	7.04	4.10	3.78	4.05	4.24	-------
19	3.68	4.28	5.33	4.48	7.78	6.08	7.75	4.05	3.75	3.90	4.33	-------
20	3.68	4.56	5.33	4.38	6.78	5.98	7.14	4.05	3.75	3.85	4.28	-------
21	3.68	5.17	5.28	4.70	5.98	6.05	6.38	4.00	3.70	3.80	4.19	5.00
22	3.68	6.38	5.18	5.38	5.68	6.33	5.98	4.00	3.70	3.80	4.05	-------
23	3.65	6.68	6.31	6.38	5.33	6.38	5.96	4.02	3.75	3.75	3.90	-------
24	3.68	7.83	5.98	6.58	4.93	6.33	6.18	4.05	3.70	3.72	3.80	-------
25	3.70	8.07	6.05	6.38	4.80	5.93	6.40	4.20	3.70	3.68	3.78	-------
26	3.72	7.38	6.08	6.20	4.98	5.76	6.26	4.22	3.85	3.68	3.76	-------
27	3.85	6.88	6.28	5.58	4.98	5.81	5.90	4.22	3.78	3.75	3.73	-------
28	3.85	6.58	5.78	4.93	5.08	8.01	5.72	4.47	3.95	3.89	3.68	-------
29	4.00	6.18	5.73	4.78	-------	10.30	5.48	6.32	4.30	4.20	3.68	-------
30	4.12	5.88	5.13	4.78	-------	9.93	5.78	6.10	4.15	4.26	3.65	4.2[illegible]
31	4.20	-------	4.86	4.68	-------	8.40	-------	6.00	-------	4.05	3.63	-------

NOTE—Gage height Sept. 11-16, 18-20 and 22-29 unsatisfactory.

Daily discharge, in second-feet, of Shenango River near Turnerville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	47	285	138	98	160	660	253	285	26	17	4.8
2	26	57	477	301	104	205	535	269	221	18	19	6.3
3	33	68	458	335	86	404	440	253	160	11	26	6.3
4	39	57	660	477	92	458	335	221	116	8.9	22	6.3
5	35	57	575	496	138	515	253	175	86	7.0	29	12
6	22	62	555	386	301	754	205	152	61	7.0	22	10
7	16	66	515	301	352	1,120	182	130	42	7.0	22	10
8	14	62	477	318	477	1,200	145	110	29	6.3	40	9.3
9	11	55	386	269	683	932	152	92	23	7.0	47	7.0
10	11	42	285	221	754	804	168	92	22	7.0	52	9.3
11	11	35	237	269	683	660	221	80	19	8.9	52	30
12	10	33	205	123	515	515	237	68	17	10	37	60
13	8.9	29	182	130	440	440	221	57	16	21	29	59
14	8.9	23	253	130	369	386	190	47	16	26	35	57
15	8.9	21	253	98	318	369	190	37	16	37	28	46
16	7.7	21	253	92	369	352	237	37	11	47	20	38
17	7.0	21	253	86	555	301	335	33	11	41	19	38
18	7.0	28	205	80	804	318	458	29	10	26	41	109
19	6.3	45	182	66	617	301	617	26	8.9	16	50	83
20	6.3	74	182	55	422	285	477	26	8.9	14	45	82
21	6.3	152	175	92	285	301	352	22	7.0	11	36	130
22	6.3	352	160	190	237	335	285	22	7.0	11	24	121
23	5.4	404	335	352	182	352	285	23	8.9	8.9	16	93
24	6.3	617	285	386	123	335	318	26	7.0	7.7	11	75
25	7.0	683	301	352	104	269	352	37	7.0	6.3	10	68
26	7.7	535	301	318	130	253	335	39	14	6.3	9.3	62
27	14	440	335	221	130	253	269	39	10	8.9	8.1	55
28	14	386	253	123	145	660	237	65	21	16	6.3	48
29	22	318	237	104	-------	1,360	205	335	53	37	6.3	45
30	31	269	152	104	-------	1,200	253	301	33	43	6.3	40
31	37	-------	110	92	-------	754	-------	285	-------	26	4.8	-------

NOTE—Discharge Sept. 11-16, 18-20 and 22-29 estimated, because of unsatisfactory gage height record, from discharge of Shenango River near Jamestown.

Monthly discharge of Shenango River near Turnerville, for the year ending Sept. 30, 1921

(Drainage area 152 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	39	5.4	15.0	0.099	0.11
November	683	21	169	1.11	1.24
December	660	110	307	2.02	2.33
January	496	55	216	1.42	1.64
February	804	86	340	2.24	2.33
March	1,360	160	534	3.51	4.05
April	660	145	305	2.01	2.24
May	335	22	109	.717	.83
June	285	7.0	44.9	.295	.33
July	47	6.3	17.2	.113	.13
August	52	4.8	25.5	.168	.19
September	130	4.8	47.3	.311	.35
The year	1,360	4.8	177	1.16	15.77

OHIO BASIN—STATION NO. 31

SHENANGO RIVER NEAR JAMESTOWN

Location.—At two-span steel highway bridge, known as Frye Bridge, about one and one-half miles downstream from Jamestown, Mercer County.

Drainage Area.—182 square miles.

Records Available.—December 2, 1919, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by Hugh P. McClimans. Elevation of gage zero 955.00 feet, United States Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank is low and overflow begins at a stage of 7 feet; left is high and not subject to overflow. Bed is composed of gravel and boulders. Control is at a riffle about 50 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 6.7 feet at midnight March 29-30 (discharge, 1,680 second-feet); minimum, 1.19 feet at 6.30 a. m. July 25 (discharge, 6.0 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve fairly well defined below 1,600 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Shenango River near Jamestown, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
12	Oct. 23	R. J. Ferris	1.28	6.79
13	Apr. 24	J. M. Snavely	3.09	384
14	May 15	J. M. Snavely	1.66	46.7
15	July 28*	H. J. McIntyre	1.46	25.9
16	Sept. 19	R. J. Ferris	2.08	144

* Measurement made by wading 50 feet above gage.

Daily Mean Gage Height, in feet, of Shenango River near Jamestown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.57	1.62	2.98	2.27	2.20	2.34	4.51	2.73	2.94	1.52	1.42	1.23
2	1.59	1.82	3.98	3.42	2.05	3.10	4.04	2.86	2.72	1.44	1.75	1.26
3	1.58	1.92	3.68	3.25	2.07	3.68	3.71	2.83	2.36	1.33	1.74	1.25
4	1.60	1.81	4.20	3.75	2.27	2.80	3.26	2.63	2.13	1.29	1.57	1.26
5	1.58	1.78	4.35	3.79	2.44	3.89	2.86	2.46	1.97	1.26	1.58	1.34
6	1.47	1.81	4.18	3.49	3.33	4.84	2.58	2.24	1.84	1.22	1.50	1.34
7	1.41	1.84	3.79	3.11	3.37	5.84	2.35	2.12	1.64	1.20	1.67	1.32
8	1.38	1.83	3.78	3.41	3.73	6.09	2.24	2.07	1.56	1.24	1.68	1.92
9	1.37	1.76	3.39	3.06	4.67	5.52	2.34	2.00	1.52	1.24	1.68	1.28
10	1.32	1.69	3.01	2.80	4.75	4.84	2.48	1.96	1.40	1.24	1.72	1.26
11	1.32	1.60	2.76	2.93	4.59	4.31	2.66	1.90	1.38	1.26	1.72	1.60
12	1.29	1.61	1.61	2.46	4.09	3.91	2.72	1.83	1.41	1.31	1.66	1.91
13	1.28	1.58	2.52	2.30	3.67	3.82	2.66	1.72	1.40	1.42	1.58	1.90
14	1.30	1.52	3.03	2.25	3.42	3.51	2.51	1.70	1.38	1.48	1.60	1.88
15	1.30	1.50	2.91	2.16	3.20	3.38	2.66	1.65	1.34	1.60	1.54	1.83
16	1.30	1.52	2.81	2.09	3.70	3.54	2.68	1.62	1.28	1.58	1.46	1.70
17	1.31	1.63	2.82	2.12	4.01	3.12	3.00	1.58	1.32	1.54	1.61	1.75
18	1.28	1.57	2.71	2.11	4.70	3.22	3.74	1.55	1.28	1.54	1.97	2.26
19	1.28	1.78	2.58	2.43	4.24	3.14	4.10	1.54	1.26	1.49	1.78	2.09
20	1.28	1.92	2.48	2.19	3.66	3.04	3.88	1.51	1.25	1.43	1.68	2.08
21	1.30	2.52	2.75	2.21	3.12	3.10	3.34	1.48	1.26	1.35	1.64	2.38
22	1.28	3.93	2.67	2.94	2.74	3.30	2.92	1.52	1.25	1.33	1.54	2.33
23	1.31	3.68	3.23	3.61	2.52	3.41	3.14	1.60	1.27	1.28	1.43	2.16
24	1.29	4.20	2.66	3.36	2.31	3.27	2.09	1.50	1.27	1.24	1.38	2.03
25	1.31	4.56	2.91	3.15	2.20	3.04	3.26	1.86	1.23	1.20	1.34	1.98
26	1.36	4.12	3.52	3.07	2.38	2.77	3.24	1.69	1.37	1.62	1.33	1.92
27	1.42	3.68	3.23	2.85	2.22	2.62	2.92	1.64	1.50	1.36	1.35	1.86
28	1.46	3.44	2.77	2.39	2.34	4.98	2.78	2.77	1.98	1.43	1.28	1.79
29	1.52	3.18	2.70	2.21		6.18	2.66	3.52	1.89	2.02	1.25	1.72
30	1.60	2.88	2.50	2.07		6.11	2.82	3.18	1.71	1.80	1.24	1.68
31	1.61		2.21	2.16		4.86		3.09		1.58	1.24	

NOTE—Stage-discharge relation Dec. 21 and Jan. 17-20 affected by ice.

Daily discharge, in second-feet, of Shenango River near Jamestown, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	44	330	158	148	180	815	268	317	32	22	7.9
2	40	74	640	450	117	360	640	292	257	24	62	9.5
3	39	92	540	390	117	540	540	292	180	14	61	9.0
4	41	72	710	570	158	570	420	246	138	11	38	9.5
5	39	67	780	570	202	605	292	202	101	9.5	39	15
6	27	72	710	480	420	920	235	158	77	7.4	30	15
7	21	77	570	360	450	1,320	180	127	47	6.5	51	14
8	18	75	570	450	540	1,440	158	117	37	8.4	52	14
9	18	64	450	360	885	1,200	180	107	32	8.4	52	11
10	14	54	330	280	920	920	213	99	20	8.4	58	9.5
11	14	41	268	317	850	745	246	88	18	9.5	58	41
12	11	42	235	202	675	605	257	75	21	13	49	90
13	11	39	213	180	540	570	246	58	20	22	39	88
14	12	32	330	158	450	480	213	55	18	28	41	84
15	12	30	304	138	390	450	246	48	15	41	34	75
16	12	32	280	127	540	480	257	44	11	39	26	55
17	13	45	280	110	640	360	330	39	14	34	42	62
18	11	38	257	100	885	390	540	36	11	34	101	158
19	11	67	235	90	710	360	675	34	9.5	29	67	127
20	11	92	213	90	540	330	605	31	9.0	23	52	127
21	12	213	200	148	360	360	420	28	9.5	16	47	191
22	11	605	246	317	268	420	304	32	9.0	14	34	180
23	13	540	390	510	213	450	360	41	10	11	23	138
24	11	710	246	450	169	420	360	30	10	8.4	18	117
25	13	850	304	390	148	330	420	81	7.9	6.5	15	103
26	17	675	480	360	191	268	390	54	18	44	14	92
27	22	540	390	292	148	235	304	47	30	17	16	81
28	26	450	268	191	180	1,000	280	268	103	23	11	68
29	32	390	257	148	-------	1,480	246	480	86	107	9.0	58
30	41	304	213	117	-------	1,440	280	390	56	70	8.4	52
31	42	-------	148	138	-------	960	-------	360	-------	39	8.4	-------

NOTE—Discharge Dec. 21 and Jan. 17-20 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Shenango River near Turnerville.

Monthly discharge of Shenango River near Jamestown, for the year ending Sept. 30, 1921

(Drainage area 182 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	42	11	21.1	0.116	0.13
November	850	30	214	1.18	1.32
December	780	148	367	2.02	2.33
January	570	90	279	1.53	1.76
February	920	117	423	2.32	2.42
March	1,480	180	651	3.58	4.13
April	815	158	355	1.95	2.18
May	480	28	136	.747	.86
June	317	7.9	56.4	.310	.35
July	107	6.5	24.5	.135	.16
August	101	8.4	38.0	.209	.24
September	191	7.9	70.0	.385	.43
The year	1,480	6.5	218	1.20	16.31

OHIO BASIN—STATION NO. 32

LITTLE SHENANGO RIVER AT GREENVILLE

Location.—At single-span steel highway bridge, known as Quaker Bridge, Columbia Avenue, Greenville, Mercer County.

Drainage Area.—107 square miles.

Records Available.—January 1, 1914, to September 30, 1918, and November 7, 1919, to September 30, 1921.

Gage.—Staff attached to upstream corner of right abutment; read by James R. Marks. Elevation of gage zero 944.50 feet, United State Geological Survey datum.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of sand and gravel. Control for low stages is a course gravel and boulder bar, about 300 feet below gage, permanent; for high stages is a dam on the Shenango River just below the mouth of Little Shenango River.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 4.5 feet at 10 p. m. March 28 (discharge, 1,420 second-feet); minimum, 1.12 feet at 5 p. m. September 16 (discharge, 8.1 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 1,800 second-feet and fairly well defined between 1,800 and 2,800 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Little Shenango River at Greenville, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
31	Apr. 25	J. M. Snavely	1.86	134
32	July 29	H. J. McIntyre	1.58	73.0

Daily Mean Gage Height, in feet, of Little Shenango River at Greenville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.47	1.29	1.74	1.76	1.84	1.98	3.09	2.37	1.52	1.39	1.57	1.19
2	1.44	1.39	2.90	2.85	1.82	2.42	2.45	2.06	1.42	1.31	1.90	1.21
3	1.40	1.54	2.71	2.50	1.78	3.38	2.10	1.90	1.38	1.26	2.23	1.22
4	1.33	1.40	2.16	2.08	1.67	2.44	1.97	1.95	1.34	1.18	1.79	1.34
5	1.28	1.35	2.30	2.01	1.95	2.18	1.85	1.84	1.30	1.20	1.50	1.52
6	1.23	1.34	2.81	2.08	2.92	3.31	1.78	1.76	1.30	1.17	1.40	1.31
7	1.22	1.30	2.15	1.88	2.63	3.59	1.61	1.66	1.28	1.18	2.07	1.26
8	1.20	1.25	1.85	2.70	2.76	2.94	1.66	1.60	1.30	-------	1.83	1.24
9	1.22	1.31	1.76	2.20	2.95	2.72	1.96	1.54	1.28	-------	1.55	1.22
10	1.18	1.37	1.75	2.60	2.69	2.84	2.05	1.53	1.26	1.44	1.42	1.17
11	1.19	1.32	1.74	1.84	2.32	2.29	2.10	1.47	1.24	1.49	1.38	1.27
12	1.18	1.31	1.78	1.78	2.20	2.09	2.06	1.45	1.22	1.59	1.51	1.26
13	1.18	1.31	1.83	1.70	2.10	2.61	1.84	1.48	1.23	1.76	1.41	1.25
14	1.18	1.21	2.39	1.64	2.09	2.26	1.77	1.66	1.24	1.46	1.38	1.22
15	1.16	1.20	2.41	1.76	2.06	2.06	2.28	1.52	1.18	1.62	1.35	1.17
16	1.17	1.21	2.08	1.70	2.55	2.31	2.08	1.45	1.21	1.42	1.32	1.12
17	1.17	1.36	1.92	1.71	2.90	2.12	2.89	1.44	1.22	1.33	1.39	1.39
18	1.15	1.49	1.86	1.69	2.15	2.22	2.69	1.41	1.20	1.22	1.94	1.82
19	1.16	1.50	1.89	1.62	2.00	2.05	2.20	1.39	1.20	-------	1.80	1.56
20	1.15	1.53	1.95	1.60	1.82	1.94	1.94	1.37	1.14	-------	1.53	1.47
21	1.16	2.03	1.80	1.87	1.75	2.16	1.90	1.33	1.16	1.40	1.45	1.62
22	1.14	2.25	1.74	2.44	1.68	2.42	1.89	1.34	1.17	1.24	1.34	2.20
23	1.17	2.36	2.88	3.32	1.74	2.06	2.02	1.48	1.34	1.18	1.30	1.52
24	1.14	2.00	2.60	2.42	1.76	1.91	1.96	1.46	1.25	1.17	1.24	1.40
25	1.14	1.92	2.16	1.92	1.60	2.45	1.81	1.73	1.16	1.23	1.26	1.51
26	1.21	1.90	1.85	2.00	1.73	2.08	1.72	1.62	1.38	1.64	1.24	1.94
27	1.22	1.77	1.76	1.66	1.67	1.95	1.70	1.48	1.42	1.60	1.20	1.58
28	1.33	1.70	1.77	1.63	2.10	3.61	1.85	1.49	1.40	1.46	1.20	1.46
29	1.36	1.64	2.04	1.52	-------	4.02	2.29	2.33	2.42	1.83	1.21	1.42
30	1.39	1.58	1.72	1.72	-------	3.29	3.11	1.94	1.61	2.22	1.22	1.38
31	1.32	-------	1.64	2.04	-------	2.40	-------	1.68	-------	1.69	1.16	-------

NOTE—Gage height July 8, 9, 19 and 20 unsatisfactory.

Daily discharge, in second-feet, of Little Shenango River at Greenville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	28	98	102	119	153	580	262	60	41	68	16
2	48	41	484	461	115	279	298	171	45	30	133	18
3	42	63	394	316	106	734	184	133	39	24	228	19
4	33	42	198	184	85	298	150	146	34	15	108	34
5	27	36	244	158	146	212	122	119	29	17	57	60
6	21	34	438	184	484	681	106	102	29	14	42	30
7	19	29	198	128	374	843	75	83	27	15	171	24
8	17	23	122	394	416	508	83	73	29	26	117	22
9	19	30	102	212	508	394	148	63	27	38	65	19
10	15	38	100	158	394	461	171	62	24	48	45	14
11	16	32	98	119	244	244	184	52	22	56	39	25
12	15	30	106	106	212	184	171	50	19	71	59	24
13	15	30	117	90	184	354	119	54	21	102	44	23
14	15	18	279	80	171	228	104	83	22	51	39	19
15	12	17	279	102	171	171	244	60	15	76	36	14
16	14	18	184	90	335	244	184	50	18	45	32	8.1
17	14	37	138	92	484	184	484	48	19	33	41	41
18	11	56	124	88	198	212	394	44	17	19	143	115
19	12	57	131	76	158	171	212	41	17	26	110	67
20	11	62	146	73	115	143	143	38	10	34	62	52
21	12	171	110	126	100	198	133	33	12	42	50	67
22	10	228	98	298	87	279	131	34	14	22	34	184
23	14	262	484	681	98	171	158	54	34	15	29	60
24	10	158	354	279	102	136	148	51	23	14	22	42
25	10	138	198	138	73	298	112	96	12	21	24	59
26	18	133	122	158	96	184	94	76	39	80	22	143
27	19	104	102	83	85	146	90	54	45	73	17	70
28	33	90	104	78	184	843	122	56	42	51	17	51
29	37	80	171	60	-------	1,080	244	262	279	117	18	45
30	41	70	94	94	-------	681	580	143	75	212	19	39
31	32	-------	80	171	-------	279	-------	87	-------	88	12	-------

NOTE—Discharge July 8, 9, 19 and 20 estimated, because of unsatisfactory gage height record, from study of gage height graph and discharge of streams in adjacent drainage basins.

Monthly discharge of Little Shenango River at Greenville, for the year ending Sept. 30, 1921

(Drainage area 107 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	52	10	21.4	0.200	0.23
November	262	17	71.8	.671	.75
December	484	80	190	1.78	2.05
January	681	60	174	1.63	1.88
February	508	73	209	1.95	2.03
March	1,080	136	355	3.32	3.83
April	580	75	199	1.86	2.08
May	262	33	86.5	.808	.93
June	279	10	36.6	.342	.38
July	212	14	49.0	.458	.53
August	228	12	61.4	.574	.66
September	212	8.1	46.8	.437	.49
The year	1,080	8.1	125	1.17	15.84

OHIO BASIN—STATION NO. 33

PYMATUNING CREEK NEAR ORANGEVILLE

Location.—At single-span steel highway bridge, about two miles southeast of Orangeville, Mercer County.

Drainage Area.—170 square miles.

Records Available.—January 1, 1914, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by D. S. Stecher.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank is high and not subject to overflow; left begins to overflow at a stage of about 5.4 feet. Bed is composed of gravel and boulders. Low-water control is at a riffle about 30 feet below gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 6.4 feet at midnight March 29-30 (discharge, 1,980 second-feet); minimum, 0.6 foot several days in October (discharge, 3.3 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Regulation.—During low stages slight variations in gage height are caused by operation of mills.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 1,500 second-feet. Gage read to tenths twice daily until April 24 and to hundredths twice daily after that date. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except for low stages which are fair, owing to probable effect of mill operation above the station.

Discharge Measurements of Pymatuning Creek near Orangeville, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
36	Apr. 25	J. M. Snavely	2.25	370
37	May 15	J. M. Snavely	.98	33.1
38	July 28*	H. J. McIntyre	1.19	70.1

*Measurement made by wading 150 feet below gage.

Daily Mean Gage Height, in feet, of Pymatuning Creek near Orangeville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	1.0	2.0	1.45	1.6	2.05	4.05	2.17	2.20	0.90	1.10	0.84
2	1.5	1.2	2.1	2.15	1.4	2.3	3.45	2.17	1.87	.95	1.37	.88
3	1.4	1.35	2.6	2.7	1.6	2.0	3.05	2.06	1.50	.90	1.46	.78
4	1.25	1.25	2.6	2.6	1.55	2.0	2.7	2.03	1.25	.87	1.42	.72
5	1.35	1.2	2.6	2.35	1.7	2.6	2.4	1.75	.97	.95	1.35	.70
6	1.1	1.2	2.6	2.05	2.65	3.75	2.1	1.51	.91	.87	1.40	.76
7	.95	1.25	2.4	2.4	3.15	4.65	1.9	1.55	1.02	.93	1.35	.75
8	.8	1.15	2.15	2.85	3.6	5.15	1.8	1.31	.87	.90	1.42	.68
9	.75	1.0	2.0	2.6	4.75	5.8	1.65	1.18	1.05	.97	1.35	.74
10	.65	1.05	1.95	2.4	4.4	5.5	1.6	1.25	.87	.93	1.58	.80
11	.6	.85	1.9	2.05	4.05	4.9	1.7	1.23	1.06	1.01	1.60	.70
12	.6	.95	1.8	2.15	3.5	4.4	1.7	1.00	.97	1.20	1.22	.95
13	.7	.8	1.9	1.9	3.4	3.9	1.8	1.13	.87	1.40	1.48	1.25
14	.65	.8	2.6	1.7	3.25	3.6	1.9	1.11	.85	1.33	1.55	1.08
15	.7	1.0	2.4	1.7	3.2	3.55	1.9	.99	.75	1.03	1.28	1.20
16	.7	.75	2.25	1.5	3.1	3.4	2.1	1.01	.71	1.10	1.40	1.25
17	.7	.95	2.1	1.4	3.0	2.85	2.5	1.03	.83	.83	1.45	1.28
18	.65	1.1	1.85	1.3	2.9	2.45	2.7	.90	.74	.81	1.35	1.20
19	.75	1.25	1.9	1.3	2.9	2.3	2.5	.85	.75	.87	1.70	1.25
20	.6	1.5	1.8	1.4	2.3	2.0	2.3	1.00	.77	1.20	1.45	1.18
21	.75	1.7	1.85	1.7	2.05	2.05	2.2	1.03	.83	1.30	1.38	1.18
22	.6	2.2	1.75	2.55	1.8	2.2	2.3	.85	.83	.87	1.48	1.32
23	.6	2.75	2.1	2.95	1.65	2.25	2.65	.87	.75	.93	1.18	1.22
24	.6	3.25	2.3	3.4	1.55	2.2	2.3	.96	.83	.80	1.10	1.30
25	.6	3.3	2.05	3.0	1.55	2.15	2.22	.87	.84	.90	.92	1.42
26	.75	2.2	1.8	2.7	1.5	1.95	2.65	1.10	.83	1.20	.94	1.44
27	.7	2.95	1.7	2.15	1.5	1.94	2.53	1.20	1.15	1.55	.86	1.35
28	.85	2.55	1.75	1.95	1.65	4.06	2.17	1.45	1.30	1.32	.85	1.32
29	.85	2.35	1.9	1.7	------	5.85	2.35	1.85	1.37	1.60	.78	1.45
30	.9	2.15	1.6	1.7	------	5.95	2.25	2.27	1.16	1.35	.82	1.32
31	1.0	------	1.3	1.75	------	4.69	------	2.33	------	1.32	.84	------

Daily discharge, in second-feet, of Pymatuning Creek near Orangeville, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	128	38	243	118	149	256	813	281	294	24	54	17
2	128	71	268	281	108	320	625	281	206	31	102	22
3	108	98	399	426	149	243	509	256	128	24	120	12
4	80	80	399	399	138	243	426	256	80	21	112	8.3
5	98	71	399	333	171	399	346	182	34	31	98	7.3
6	54	71	399	256	299	749	268	128	25	21	108	10.5
7	31	80	346	346	566	1,020	218	138	41	28	98	10.0
8	13	62	281	453	686	1,280	194	91	21	24	112	6.4
9	10.0	38	243	399	1,100	1,590	160	68	46	34	98	9.4
10	5.2	46	230	346	950	1,420	149	80	21	28	149	13
11	3.3	18	218	256	813	1,140	171	76	48	40	149	7.3
12	3.3	31	194	281	655	950	171	58	34	71	75	31
13	7.3	13	218	218	625	781	194	59	21	108	124	80
14	5.2	13	399	171	566	686	218	56	18	95	138	51
15	7.3	38	346	171	566	686	218	37	10.0	43	85	71
16	7.3	10.0	307	128	537	625	268	40	7.8	54	108	80
17	7.3	31	268	108	509	453	372	43	16	16	118	85
18	5.2	54	206	89	481	359	426	24	9.4	14	98	71
19	10.0	80	218	89	481	320	372	18	10.0	21	171	80
20	3.3	128	194	108	320	243	320	38	11	71	118	68
21	10.0	171	206	171	256	256	294	43	16	89	104	68
22	3.3	294	182	399	194	294	320	18	16	21	124	93
23	3.3	453	268	509	160	307	399	21	10.0	28	68	75
24	3.3	566	320	625	138	294	320	32	16	13	54	89
25	3.3	595	256	509	138	281	294	21	17	24	27	112
26	10.0	566	194	426	128	230	399	54	16	71	30	116
27	7.3	509	171	281	128	230	372	71	62	138	20	98
28	18	399	182	230	160	813	281	118	89	93	18	93
29	18	333	218	171	-------	1,590	333	206	102	149	12	118
30	24	281	149	171	-------	1,720	307	307	64	98	15	93
31	38	-------	89	182	-------	1,060	-------	333	-------	93	17	-------

Monthly discharge of Pymatuning Creek near Orangeville, for the year ending Sept. 30, 1921

(Drainage area 170 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	128	3.3	27.5	0.162	0.19
November	595	10.0	175	1.03	1.15
December	399	89	258	1.52	1.75
January	625	89	279	1.64	1.89
February	1,100	108	403	2.37	2.47
March	1,720	230	672	3.95	4.55
April	813	149	325	1.91	2.13
May	333	18	110	.647	.75
June	294	7.8	49.6	.292	.33
July	149	13	52.1	.306	.35
August	171	12	87.9	.517	.60
September	118	6.4	56.5	.332	.37
The year	1,720	3.3	207	1.22	16.53

OHIO BASIN—STATION NO. 34

SHENANGO RIVER AT SHARON

Location.—At single-span steel highway bridge, Chestnut Street, Sharon, Mercer County.

Drainage Area.—611 square miles.

Records Available.—August 1, 1909, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Carnegie Steel Company. The Sanborn water-stage recorder installed on downstream end of right abutment was not operated after October 30. Elevation of gage zero 840.00 feet, United States Geological Survey datum.

Discharge Measurements.—Made from the Mill, Chestnut or State Street bridges, or by wading.

Channel and Control.—Banks begin to overflow at a stage of about 12 feet. Bed is composed of silt and gravel. Control is a water main, backed with gravel and boulders, about one-quarter of a mile below the gage; probably permanent.

Extremes of Discharge.—Maximum stage during the year, 8.4 feet observed at 5 p. m. March 29 (discharge, 4,230 second-feet); minimum, 1.9 feet at 8 a. m. August 29 (discharge, 29 second-feet).

Ice.—Water from this river is used for industrial purposes and returned to stream at sufficiently high temperature to usually prevent the formation of ice for a considerable distance below the station.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve well defined below 2,000 second-feet; fairly well defined between 2,000 and 5,000 second-feet and well defined between 5,000 and 9,000 second-feet. Gage read to hundredths twice daily until March 27; since that date to tenths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good except those for extremely low stages which are fair.

Cooperation.—Station is maintained in cooperation with Carnegie Steel Company, Farrell.

Discharge Measurements of Shenango River at Sharon, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
107	Apr. 25*	J. M. Snavely	4.39	957
108	July 29*	J. M. Snavely	2.72	206

*Measurements made at Mill Street bridge.

Daily Mean Gage Height, in feet, of Shenango River at Sharon, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.36	2.36	3.92	3.65	3.58	4.02	6.9	4.7	3.95	3.05	2.85	2.05
2	2.41	2.46	5.34	5.05	3.55	4.78	6.1	4.3	3.85	2.75	3.0	2.15
3	2.42	2.54	5.32	5.15	3.32	6.20	5.4	4.2	3.7	-------	3.9	2.1
4	2.46	2.75	5.04	4.70	3.30	5.58	4.9	4.1	3.4	-------	3.45	2.15
5	2.49	2.67	5.08	4.85	3.45	5.30	4.5	3.9	3.15	-------	2.95	2.0
6	2.42	2.58	5.45	4.72	4.70	6.35	3.95	3.75	3.05	2.4	2.8	2.1
7	2.37	2.48	5.08	4.95	5.65	7.57	3.75	3.5	3.0	2.4	2.75	2.3
8	2.34	2.56	4.70	5.18	6.12	7.62	3.8	3.35	2.9	-------	3.2	2.15
9	2.20	2.58	4.48	5.02	6.25	7.20	4.3	3.2	2.8	2.2	3.0	2.0
10	2.19	2.46	4.25	4.48	6.70	6.95	4.3	3.05	2.6	-------	2.75	2.0
11	2.14	2.42	4.10	4.02	6.22	6.08	4.2	2.9	2.4	-------	2.6	2.1
12	2.09	2.36	3.72	-------	5.72	5.65	4.25	2.9	2.3	-------	2.55	2.2
13	2.05	2.30	3.60	3.32	5.40	5.45	4.1	2.9	2.15	3.4	2.6	2.4
14	2.04	2.21	4.30	3.42	5.08	5.20	4.1	3.0	2.2	2.95	2.5	2.5
15	2.01	2.18	4.55	3.28	5.05	4.91	4.45	2.9	2.1	-------	2.35	2.6
16	1.98	2.18	4.45	3.38	5.20	5.02	4.6	3.1	2.1	-------	2.3	2.6
17	1.96	2.31	4.12	3.08	5.82	4.87	4.95	3.1	2.1	-------	2.35	2.75
18	1.96	2.49	3.98	3.02	5.45	4.67	5.5	2.9	2.1	2.3	2.45	3.0
19	1.95	2.64	3.70	2.92	5.35	4.54	5.1	2.8	-------	2.2	3.1	3.15
20	1.94	2.80	3.45	2.82	4.88	4.34	5.05	2.75	-------	2.4	2.85	2.8
21	1.94	3.23	3.35	2.95	4.65	4.62	4.75	2.7	-------	2.5	2.6	2.85
22	1.95	4.44	3.58	3.85	4.28	5.00	4.4	2.7	-------	2.4	2.5	3.45
23	1.99	4.86	4.58	5.85	4.00	4.74	4.6	2.6	-------	2.3	2.4	3.4
24	1.98	4.81	4.72	5.48	3.60	4.62	4.65	2.6	2.1	2.25	2.3	3.0
25	1.98	4.95	4.60	4.62	3.32	4.88	4.35	3.0	2.2	2.1	2.2	2.85
26	1.98	5.16	4.52	4.08	3.50	4.62	4.3	3.5	2.4	2.0	2.25	3.3
27	2.05	5.02	4.42	3.92	3.55	4.2	4.25	3.25	2.1	2.05	2.2	3.0
28	2.04	4.52	4.32	3.55	3.92	5.9	4.2	3.2	2.1	-------	2.05	2.75
29	2.06	4.30	4.10	3.38	-------	8.05	4.4	4.45	3.05	-------	1.95	2.65
30	2.18	4.08	3.62	3.48	-------	8.1	4.9	4.55	3.7	-------	2.0	2.6
31	2.28	-------	3.32	3.35	-------	6.95	-------	4.1	-------	3.35	2.05	-------

NOTE—Gage height Jan. 12, June 19-23, July 3-5, 8, 10-12, 15-17 and 28-30 unsatisfactory.

Daily discharge, in second-feet, of Shenango River at Sharon, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	106	106	700	570	545	755	2,730	1,160	728	296	228	50
2	116	128	1,520	1,340	520	1,220	2,080	920	672	200	277	66
3	119	149	1,520	1,460	400	2,160	1,590	865	595	200	700	58
4	128	200	1,340	1,160	400	1,730	1,280	810	447	170	471	66
5	135	174	1,400	1,220	471	1,520	1,040	700	334	150	260	42
6	119	161	1,590	1,160	1,160	2,320	728	620	296	114	213	58
7	108	132	1,400	1,340	1,730	3,380	620	495	277	114	200	93
8	101	149	1,160	1,460	2,080	3,380	645	424	243	120	354	66
9	75	161	1,040	1,340	2,160	3,000	920	355	213	75	277	42
10	73	128	980	1,040	2,560	2,820	920	296	161	150	200	42
11	65	119	810	755	2,160	2,080	865	243	114	220	161	58
12	56	106	595	600	1,800	1,730	875	243	93	340	149	75
13	50	93	545	400	1,590	1,590	810	243	66	447	161	114
14	48	77	920	447	1,460	1,460	810	277	75	260	137	137
15	41	72	1,100	400	1,340	1,280	980	243	58	220	104	161
16	39	72	980	447	1,460	1,340	1,100	314	58	170	93	161
17	37	95	810	314	1,870	1,280	1,340	314	58	150	104	200
18	37	135	755	277	1,590	1,160	1,660	243	58	93	126	277
19	36	174	595	243	1,500	1,040	1,400	213	60	75	314	354
20	34	213	471	213	1,280	920	1,340	200	60	114	228	213
21	34	378	424	260	1,100	1,100	1,220	186	44	137	161	228
22	36	980	545	672	920	1,340	980	186	44	114	137	471
23	41	1,280	1,100	1,870	755	1,160	1,100	161	44	93	114	447
24	39	1,220	1,160	1,660	545	1,100	1,100	161	58	84	93	277
25	39	1,340	1,100	1,100	400	1,280	980	277	75	58	75	228
26	39	1,460	1,040	810	495	1,100	920	495	114	42	84	400
27	50	1,340	980	700	520	865	865	378	58	50	75	277
28	48	1,040	920	520	700	1,940	865	355	58	170	50	200
29	52	920	810	447	-------	3,790	980	980	570	190	36	174
30	72	810	545	495	-------	3,900	1,280	1,100	595	650	42	161
31	89	-------	400	424	-------	2,820	-------	810	-------	421	50	-------

NOTE—Discharge Jan. 12, June 19-23, July 3-5, 8, 10-12, 15-17 and 28-30 estimated, because of unsatisfactory gage height record, from study of gage height graphs and discharge of Shenango River at New Castle.

Monthly discharge of Shenango River at Sharon, for the year ending Sept. 30, 1921

(Drainage area 611 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	135	34	66.6	0.109	0.13
November	1,460	72	447	.732	.82
December	1,590	400	944	1.55	1.79
January	1,870	213	811	1.33	1.53
February	2,560	400	1,200	1.96	2.04
March	3,900	755	1,820	2.98	3.44
April	2,730	620	1,130	1.85	2.06
May	1,160	161	460	.753	.87
June	728	44	211	.345	.38
July	650	42	184	.301	.35
August	700	36	183	.300	.35
September	471	42	173	.283	.32
The year	3,900	34	633	1.04	14.08

OHIO BASIN—STATION NO. 35

SHENANGO RIVER AT NEW CASTLE

Location.—At two-span steel highway bridge, West Washington Street, New Castle, Lawrence County.

Drainage Area.—797 square miles.

Records Available.—January 1, 1910, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by J. L. Moseley. Elevation of gage zero 787.00 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of gravel and rock. Control is at a riffle, at the head of a low island, about 300 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 6.7 feet; at 10 p. m. March 29 (discharge, 5,340 second-feet); minimum, 0.89 foot at 4.50 p. m. September 2 (discharge, 27 second-feet).

Ice.—Stage-discharge relation seldom affected by ice.

Diversions.—The New Castle water supply is taken from the stream above the gaging station. On September 28, 1914, it was reported that the pumpage was equivalent to six second-feet.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Discharge Measurements of Shenango River at New Castle, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
37	Apr. 25	J. M. Snavely	3.06	1,100
38	July 29	H. J. McIntyre	1.78	266

Daily Mean Gage Height, in feet, of Shenango River at New Castle, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.38	1.27	2.73	2.10	2.67	2.86	5.54	3.70	2.65	2.43	1.91	0.97
2	1.43	1.36	3.63	2.42	2.37	3.06	4.90	3.17	2.55	2.05	1.68	.90
3	1.38	1.50	3.97	3.82	2.32	4.85	------	3.15	2.47	1.65	1.60	1.00
4	1.60	1.55	3.71	3.42	2.23	4.51	------	2.80	2.19	1.33	2.51	1.10
5	1.58	1.71	3.78	3.32	2.39	4.50	------	2.70	2.15	1.15	2.05	1.10
6	1.46	1.65	4.10	3.30	4.06	4.83	2.82	2.57	1.73	1.15	1.75	1.15
7	1.38	1.60	3.97	3.25	4.60	5.60	2.62	2.33	1.60	1.10	1.65	1.12
8	1.33	1.60	3.68	3.33	5.10	6.09	------	2.30	1.55	1.05	1.85	1.03
9	1.30	1.57	3.25	3.62	4.84	5.72	------	2.10	1.45	1.05	1.88	1.02
10	1.23	1.57	3.17	3.18	5.14	5.01	------	1.97	1.35	1.15	1.68	1.09
11	1.23	1.51	2.77	2.84	4.92	4.39	------	1.85	1.35	1.41	1.60	.90
12	1.18	1.45	2.60	2.72	4.52	4.12	2.95	1.77	1.35	1.43	1.60	1.32
13	1.07	1.45	2.53	2.34	4.17	4.12	2.88	1.75	1.31	1.67	1.48	1.15
14	1.05	1.45	------	2.12	3.84	4.12	2.69	1.69	1.26	1.74	1.55	1.32
15	1.05	1.43	------	2.22	3.72	3.67	3.05	3.05	1.25	1.59	1.45	1.25
16	1.00	1.40	3.30	2.12	3.92	3.97	3.38	1.55	1.05	1.43	1.39	1.31
17	1.00	1.47	2.87	2.02	4.52	3.74	3.58	1.57	1.00	1.30	1.32	1.46
18	1.00	1.45	2.57	2.12	3.02	3.42	4.35	1.55	1.15	1.25	1.31	1.55
19	.95	1.53	2.60	1.91	3.80	3.22	3.98	1.53	1.05	1.33	1.42	1.84
20	.90	1.63	2.40	1.62	3.57	3.10	3.68	1.50	.95	1.33	1.76	1.88
21	.95	1.95	2.35	1.76	3.10	3.22	3.48	1.43	.95	1.33	1.60	1.73
22	.95	2.55	------	------	2.80	3.72	3.18	1.35	.93	1.30	1.52	1.85
23	.93	3.25	------	------	2.72	3.48	3.30	1.33	.95	1.25	1.30	2.30
24	.93	3.50	------	4.50	2.54	3.20	3.50	1.33	1.07	1.25	1.31	2.00
25	1.00	3.45	------	3.45	2.32	3.10	3.15	1.76	1.05	1.20	1.22	1.88
26	1.05	3.45	------	2.82	2.26	3.41	2.95	1.93	1.15	1.10	1.14	1.81
27	1.15	3.45	------	2.62	2.32	3.09	2.93	1.94	1.15	1.05	1.08	2.02
28	1.17	3.15	3.00	2.50	2.62	3.65	2.85	1.75	1.21	1.27	1.05	1.78
29	1.15	3.05	2.70	2.30	------	6.17	3.07	2.69	1.47	1.75	1.00	1.60
30	1.07	2.75	2.34	2.45	------	6.29	3.95	3.45	2.47	1.97	1.04	1.45
31	1.20	------	2.21	2.86	------	5.56	------	2.95	------	2.51	.94	------

NOTE—Gage height Dec. 14, 15, 22-27, Jan, 22, 23, Apr. 3-5 and 8-11 unsatisfactory.

Daily discharge, in second-feet, of Shenango River at New Castle, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	125	90	865	443	795	935	3,600	1,620	795	658	347	35
2	143	118	1,530	625	592	1,120	2,850	1,200	725	416	244	28
3	125	170	1,890	1,710	560	2,730	2,000	1,200	658	231	210	38
4	210	190	1,620	1,360	530	2,400	1,600	900	500	108	690	51
5	202	256	1,710	1,280	625	2,400	1,300	830	472	60	416	51
6	155	231	1,990	1,280	1,990	2,730	900	725	265	60	274	60
7	125	210	1,890	1,200	2,510	3,730	760	592	210	51	231	55
8	108	210	1,620	1,280	3,090	4,420	750	560	190	44	319	42
9	98	198	1,200	1,530	2,730	3,860	1,100	443	151	44	333	41
10	78	198	1,200	1,200	3,090	2,970	1,200	376	115	60	244	50
11	78	174	865	935	2,850	2,290	1,100	319	115	136	210	28
12	66	151	760	830	2,400	1,990	1,000	283	115	143	210	105
13	47	151	725	592	2,090	1,990	970	274	101	239	162	60
14	44	151	1,200	443	1,710	1,990	830	248	87	270	190	105
15	44	143	1,400	500	1,620	1,620	1,040	231	84	206	151	84
16	38	132	1,280	443	1,800	1,890	1,360	190	44	143	129	101
17	38	159	935	390	2,400	1,620	1,530	198	38	98	105	155
18	38	151	725	443	1,040	1,360	2,290	190	60	84	101	190
19	33	182	760	347	1,710	1,200	1,890	182	44	108	140	314
20	28	223	625	218	1,530	1,120	1,620	170	33	108	278	333
21	33	366	592	278	1,120	1,200	1,440	143	33	108	210	265
22	33	725	800	950	900	1,620	1,200	115	31	98	178	319
23	31	1,200	1,400	2,400	830	1,440	1,280	108	33	84	98	560
24	31	1,440	1,600	2,400	725	1,200	1,440	108	47	84	101	390
25	38	1,360	1,400	1,360	560	1,120	1,200	278	44	70	76	233
26	44	1,360	1,300	900	530	1,360	1,000	356	60	51	59	301
27	60	1,360	1,200	760	560	1,120	1,000	361	60	44	48	390
28	64	1,200	1,040	690	760	1,530	935	274	73	90	44	287
29	60	1,040	830	560	------	4,560	1,120	830	159	274	38	210
30	47	865	592	658	------	4,710	1,890	1,360	658	376	43	151
31	70	------	500	935	------	3,730	------	1,000	------	690	32	------

NOTE—Discharge does not include the water diverted from the stream at the New Castle Water Works. Discharge Dec. 14, 15, 22-27, Jan. 22, 23, Apr. 3-5 and 8-11 estimated, because of unsatisfactory gage height record, from study of gage height graphs and discharge of Shenango River at Sharon.

Monthly discharge of Shenango River at New Castle, for the year ending Sept. 30, 1921

(Drainage area 797 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	210	28	75.3	0.103	0.12
November	1,440	90	480	.611	.68
December	1,990	500	1,160	1.47	1.70
January	2,400	218	934	1.18	1.36
February	3,090	530	1,490	1.87	1.95
March	4,710	935	2,190	2.76	3.18
April	3,600	750*	1,410	1.77	1.98
May	1,620	108	505	.641	.74
June	795	31	200	.260	.29
July	690	44	169	.221	.25
August	690	32	191	.247	.28
September	560	28	171	.222	.25
The Year	4,710	28	744	.941	12.78

NOTE—Discharge does not include the water diverted from the stream at the New Castle Water Works. Run-off includes the quantity of water diverted.
* Discharge estimated.

OHIO BASIN—STATION NO. 36

NESHANNOCK CREEK AT EASTBROOK STATION

Location.—At single-span wooden highway bridge, Pennsylvania Railroad station, Eastbrook, Lawrence County.

Drainage Area.—235 square miles.

Records Available.—January 19, 1914, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by J. L. Garner. Elevation of gage zero 877.53 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of gravel and rock. Control is at a riffle about 500 feet below gage; practically permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 3.7 feet at 3 a. m. June 29 (discharge 1,660 second-feet); minimum, 0.90 foot on October 23 and from 5 p. m. October 24 to 8 a. m. October 25 (discharge, 27 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year. Rating curve fairly well defined between 50 and 2,500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Neshannock Creek at Eastbrook Station, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
20	Apr. 26	J. M. Snavely	1.65	154
21	July 30	H. J. McIntyre	1.69	158

Daily Mean Gage Height, in feet, of Neshannock Creek at Eastbrook Station, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.34	1.00	1.49	------	------	2.45	3.03	2.05	1.29	2.17	1.98	1.21
2	1.46	1.01	------	------	------	2.60	2.88	2.10	1.27	1.72	1.86	1.10
3	1.30	------	------	------	1.74	3.00	2.73	1.93	1.12	1.60	1.72	1.05
4	1.24	------	------	------	2.21	2.46	2.44	1.88	1.06	1.45	1.66	1.05
5	1.19	------	------	------	2.91	2.22	1.94	1.91	1.01	1.50	1.55	1.21
6	1.00	1.08	------	------	2.86	2.46	1.83	1.81	1.02	1.57	1.68	1.01
7	1.05	1.06	------	------	2.78	2.99	1.67	1.64	1.07	1.67	2.58	1.00
8	1.04	1.00	------	------	3.01	3.39	1.59	1.61	1.06	1.77	2.60	1.02
9	1.03	1.05	------	------	2.41	3.20	2.02	1.49	1.01	1.90	1.68	1.21
10	1.04	1.21	------	------	2.50	2.87	2.34	1.47	.97	1.90	1.44	1.25
11	1.04	------	1.50	------	2.51	2.70	2.07	1.42	.99	1.79	1.36	1.65
12	1.03	------	1.56	------	2.31	2.54	1.83	1.39	.98	1.87	1.44	1.92
13	1.01	------	------	------	2.10	2.44	1.87	1.39	1.00	2.05	1.54	1.62
14	1.11	------	------	------	1.88	2.33	1.83	1.33	.97	1.70	1.61	1.38
15	1.02	1.01	------	------	2.01	2.11	2.10	1.28	------	1.66	1.52	1.75
16	1.05	.99	------	------	2.01	2.00	2.40	1.35	------	1.58	1.49	1.84
17	1.05	1.18	------	------	2.00	2.13	2.10	1.31	------	1.43	1.52	1.72
18	1.05	1.39	------	------	2.04	2.11	2.30	1.32	------	1.32	1.49	1.71
19	1.00	------	------	------	1.96	2.10	1.95	1.24	------	1.33	1.52	1.61
20	1.10	------	------	------	1.90	2.24	1.83	1.24	------	1.23	1.39	1.66
21	1.05	------	------	------	1.60	2.39	1.75	1.12	1.02	1.17	1.30	1.69
22	1.01	------	------	------	1.58	2.23	1.73	1.12	1.22	1.19	1.29	1.55
23	.90	------	------	------	1.62	2.29	1.97	1.59	2.60	1.10	1.35	1.48
24	.91	------	------	------	1.70	2.30	1.90	1.57	2.36	.99	1.26	1.49
25	.95	------	------	------	1.86	2.35	1.70	1.39	1.87	1.04	1.21	1.46
26	1.01	------	------	------	2.08	2.34	1.60	1.35	1.46	.98	1.21	1.48
27	1.16	------	------	------	2.06	2.45	1.62	1.29	1.63	1.21	1.26	1.41
28	1.72	------	------	------	2.34	2.70	1.72	1.29	2.33	1.15	1.29	1.36
29	1.78	------	------	------	------	2.64	2.05	1.21	3.05	1.45	1.02	1.45
30	1.45	1.36	------	------	------	2.40	2.02	1.10	2.40	1.69	1.01	1.56
31	1.01	------	------	------	------	3.03	------	1.02	------	1.85	1.04	------

NOTE—Gage height Nov. 3-5, 11-14, 19-29, Dec. 2-10 and Dec. 13 to Feb. 2 unsatisfactory; June 15-20 not observed.

Daily discharge, in second-feet, of Neshannock Creek at Eastbrook Station, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	35	113	170	500	500	1,000	300	71	342	280	57
2	101	35	600	420	260	600	850	320	64	172	224	45
3	71	46	600	550	190	950	720	261	45	140	172	40
4	64	75	360	300	365	500	500	242	40	101	156	40
5	57	60	280	230	850	365	261	242	35	113	126	57
6	35	45	300	200	805	500	224	207	35	126	172	35
7	40	40	240	190	760	950	156	156	40	156	600	35
8	40	35	180	460	950	1,350	140	140	40	190	600	35
9	40	40	130	550	470	1,150	280	113	35	242	172	57
10	40	57	120	300	530	805	442	101	33	242	101	64
11	40	70	113	220	530	680	300	89	34	207	80	156
12	40	65	126	200	415	565	224	89	33	224	101	242
13	35	55	160	140	320	500	224	89	35	300	126	140
14	45	40	250	180	242	442	224	80	33	172	140	89
15	35	35	550	210	280	320	320	71	30	156	113	190
16	40	34	550	200	280	280	470	80	32	140	113	224
17	40	57	420	140	280	342	320	71	36	101	113	172
18	40	89	280	150	300	320	415	71	36	80	113	172
19	35	140	160	140	261	320	261	64	36	80	113	140
20	45	190	150	120	242	390	224	64	40	64	89	156
21	40	400	140	130	140	470	190	45	35	51	71	172
22	35	340	190	360	140	390	190	45	57	57	71	126
23	27	300	360	1,200	140	415	261	140	600	45	80	113
24	28	280	400	700	172	415	242	126	442	34	64	113
25	31	260	400	360	224	442	172	89	224	40	57	101
26	35	220	300	200	320	442	140	80	101	33	57	113
27	51	180	260	220	300	500	140	71	156	57	64	89
28	172	150	260	180	442	680	172	71	442	51	71	80
29	207	110	240	150	------	640	300	57	1,000	101	35	101
30	101	80	220	220	------	470	280	45	470	172	35	126
31	35	------	150	650	------	1,000	------	35	------	224	40	------

NOTE—Discharge Nov. 3-5, 11-14, 19-29, Dec. 2-10 and Dec. 13 to Feb. 2 estimated, because of unsatisfactory gage height record, and June 15-20, because of no gage height record, from discharge of Slippery Rock Creek at Wurtemburg and Connoquenessing Creek near Hazen.

Monthly discharge of Neshannock Creek at Eastbrook Station, for the year ending Sept. 30, 1921

(Drainage area 235 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	207	27	55.6	0.237	0.27
November	400	34	119	.506	.56
December	600	113	277	1.18	1.36
January	1,200	120	305	1.30	1.50
February	950	140	382	1.63	1.70
March	1,350	280	571	2.43	2.80
April	1,000	140	321	1.37	1.53
May	320	35	118	.502	.58
June	1,000	30	144	.613	.68
July	342	33	136	.579	.67
August	600	35	140	.596	.69
September	242	35	109	.464	.52
The year	1,350	27	222	.945	12.86

OHIO BASIN—STATION NO. 37

CONNOQUENESSING CREEK NEAR HAZEN

Location.—At single-span steel highway bridge, about one-half mile south of Baltimore & Ohio Railroad station at Hazen, Beaver County.

Drainage Area.—355 square miles.

Records Available.—June 3, 1915, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read by G. W. Hall and Ezra Hazen.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Right bank begins to overflow at a stage of about 10 feet; left is high and not subject to overflow. Bed is composed of gravel and boulders. Control is a deposit of gravel on ledge about 250 feet below gage; permanent.

Extremes of Discharge.—Maximum stage during the year, estimated from hydrograph, 7.3 feet at 3 a. m. March 8 (discharge, 4,370 second-feet); minimum, 1.22 feet at 7 p. m. October 25 (discharge, 14 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation permanent throughout the year except when affected by ice. Rating curve well defined to 5,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results good.

Cooperation.—Station is maintained in cooperation with United States Engineer Office, Pittsburgh.

Discharge Measurements of Connoquenessing Creek near Hazen, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
18	Apr. 26	J. M. Snavely	1.92	153
19	26	J. M. Snavely	1.92	153
20	July 30	J. M. Snavely	1.82	117

Daily Mean Gage Height, in feet, of Connoquenessing Creek near Hazen, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.12	1.68	2.53	3.11	3.34	3.57	2.50	-------	1.59	2.47	1.54	1.38
2	2.28	1.60	3.78	-------	3.21	3.36	2.48	-------	1.61	2.30	1.53	1.38
3	2.26	2.10	3.33	-------	2.90	3.27	2.87	-------	1.58	2.20	1.50	1.37
4	2.14	1.88	3.00	-------	2.67	2.94	2.78	-------	1.52	2.06	1.48	1.34
5	1.99	1.76	2.82	-------	3.48	3.27	2.70	-------	1.48	1.88	1.47	1.34
6	1.96	1.74	2.68	-------	4.19	4.27	2.62	-------	1.46	1.70	1.44	1.59
7	1.85	1.60	2.50	2.38	3.57	6.15	2.60	-------	1.46	1.68	2.15	1.54
8	1.79	1.66	2.37	4.12	3.64	6.75	2.58	2.57	1.46	2.18	2.81	1.50
9	1.72	1.73	2.28	3.72	3.84	5.39	2.70	2.52	1.45	2.26	2.68	1.48
10	1.62	1.74	2.26	3.06	3.98	4.57	2.53	2.50	1.45	2.51	2.54	1.50
11	1.58	1.76	2.31	2.75	3.91	3.91	2.48	2.40	1.44	2.07	2.50	1.58
12	1.50	1.62	2.24	2.57	3.97	3.67	2.39	2.30	1.44	2.22	2.32	1.64
13	1.46	1.65	2.20	2.45	3.45	3.55	2.34	2.24	1.42	2.39	2.03	1.59
14	1.44	1.62	2.45	2.47	3.24	3.46	2.34	2.07	1.39	2.36	1.83	1.56
15	1.42	1.58	2.92	2.78	2.93	3.21	2.34	1.98	1.36	2.27	1.78	1.50
16	1.42	1.62	2.80	2.37	2.88	2.97	2.34	1.96	1.34	2.02	1.72	1.44
17	1.38	1.84	2.62	2.41	2.85	2.90	2.38	1.87	1.34	1.82	1.68	1.40
18	1.40	2.20	2.42	3.71	2.81	2.70	2.36	1.84	1.32	1.81	1.64	2.40
19	1.42	2.14	2.42	3.73	2.69	-------	2.32	1.82	1.34	1.89	1.58	2.38
20	1.38	2.65	2.25	3.37	2.61	2.56	2.30	1.76	1.32	1.89	1.53	1.76
21	1.38	3.03	2.26	2.96	2.57	2.56	2.28	1.70	1.31	1.82	1.48	-------
22	1.40	2.79	2.26	3.81	3.59	2.52	2.20	1.64	1.34	1.73	1.42	-------
23	1.40	2.70	2.50	4.87	3.11	2.47	2.12	1.60	1.57	1.68	1.37	-------
24	1.24	2.52	2.72	3.91	2.92	2.46	2.08	1.57	3.73	1.52	1.35	-------
25	1.23	2.58	2.46	3.63	2.77	2.38	2.06	1.56	3.00	1.45	1.34	-------
26	1.30	2.52	2.56	3.40	2.52	2.32	2.18	1.54	3.80	1.42	1.34	-------
27	1.62	2.42	2.46	3.02	2.49	2.28	2.16	1.55	3.68	1.40	1.32	-------
28	1.95	2.40	2.60	2.49	3.52	2.37	2.32	1.64	3.18	1.42	1.32	-------
29	1.77	2.27	4.12	2.35	-------	2.55	-------	1.62	3.08	1.54	1.32	-------
30	1.80	2.19	4.48	2.74	-------	2.65	-------	1.56	2.88	1.66	1.32	-------
31	1.70	-------	3.38	3.37	-------	2.66	-------	1.60	-------	1.65	1.32	-------

NOTE—Stage-discharge relation Dec. 26 to Jan. 1 and Jan. 17-21 affected by ice. Gage height Jan. 2-6 and Mar. 19 not observed: Apr. 29 to May 7 and Sept. 21-30 unsatisfactory.

Daily discharge, in second-feet, of Connoquenessing Creek near Hazen, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	236	78	455	340	987	1,180	425	1,000	58	408	49	26
2	310	60	1,340	900	875	987	414	600	62	320	47	26
3	301	227	987	1,700	670	912	637	400	56	272	42	25
4	245	139	735	600	515	702	605	400	46	210	39	23
5	181	100	605	360	1,100	912	545	400	39	139	38	23
6	169	95	545	320	1,660	1,740	485	440	36	83	34	58
7	129	60	425	360	1,180	3,380	485	500	36	78	250	49
8	109	74	355	1,580	1,180	3,920	485	455	36	263	605	42
9	89	92	310	1,260	1,340	2,660	545	425	35	301	545	39
10	65	95	301	770	1,500	1,980	455	425	35	425	455	42
11	56	100	325	575	1,420	1,420	414	370	34	214	425	56
12	42	65	291	455	1,500	1,260	365	320	34	282	330	69
13	36	72	272	398	1,060	1,180	340	291	31	365	219	58
14	34	65	398	403	912	1,060	340	214	27	350	122	53
15	31	56	670	605	702	875	340	177	24	306	106	42
16	31	65	605	355	670	702	340	169	23	193	89	34
17	26	126	485	340	637	670	360	136	23	119	78	28
18	28	272	381	320	605	545	350	126	21	115	69	370
19	31	245	381	320	545	500	330	119	23	143	56	360
20	26	515	296	380	485	455	320	100	21	143	47	100
21	26	770	301	480	455	455	310	83	20	119	39	76
22	28	605	301	1,340	1,180	425	272	69	23	92	31	702
23	28	545	455	2,220	805	408	236	60	55	78	25	296
24	15	425	545	1,420	670	403	219	55	1,260	46	24	136
25	15	485	403	1,180	575	360	210	53	735	35	23	206
26	19	425	380	1,020	425	330	263	49	1,340	31	23	210
27	65	381	340	735	420	310	254	51	1,260	28	21	146
28	166	370	340	420	1,100	355	330	69	875	31	21	139
29	103	306	320	345	-------	455	550	65	805	49	21	177
30	112	268	320	575	-------	515	1,500	53	670	74	21	154
31	83	-------	340	987	-------	515	-------	60	-------	72	21	-------

NOTE—Discharge Dec. 26 to Jan. 1 and Jan. 17-21 estimated, because of ice, from weather records, study of gage height graph and comparison with similar studies for Slippery Rock Creek at Wurtemburg. Discharge Jan. 2-0 and Mar. 19 estimated, because of no gage height record, and Apr. 29 to May 7 and Sept. 21-30, because of unsatisfactory gage height record, from discharge of Slippery Rock Creek at Wurtemburg.

Monthly discharge of Connoquenessing Creek near Hazen, for the year ending Sept. 30, 1921

(Drainage area 355 square miles)

Month	Dischaige in Second-feet			Run-off	
	Maximum	Mlnimum	Mean	Second-feet per square mile	Depth in inches
October	310	15	91.5	0.258	0.30
November	770	56	239	.673	.75
December	1,340	272	458	1.29	1.49
January	2,220	320	744	2.10	2.42
February	1,660	420	899	2.53	2.64
March	3,920	310	1,020	2.87	3.31
April	1,500	210	424	1.19	1.33
May	1,000	49	249	.701	.81
June	1,340	20	258	.727	.81
July	425	28	174	.490	.56
August	605	21	126	.355	.41
September	702	23	126	.355	.40
The year	3,920	15	398	1.12	15.23

OHIO BASIN—STATION NO. 38

SLIPPERY ROCK CREEK AT WURTEMBURG

Location.—At three-span steel highway bridge, Wurtemburg, Lawrence County, about one and a half miles above mouth of creek.

Drainage Area.—400 square miles.

Records Available.—January 1, 1912, to September 30, 1921.

Gage.—Standard chain attached to upstream side of bridge; read by Miss Grace Barton Wright. Elevation of gage zero 817.63 feet, United States Geological Survey datum.

Discharge Measurements.—Made from upstream side of bridge or by wading.

Channel and Control.—Banks are high and not subject to overflow. Bed is composed of sand and gravel. Low-water control is a sand and gravel bar about 200 feet below gage; may shift occasionally.

Extremes of Discharge.—Maximum stage during the year, 5.57 feet observed at 7.30 a. m. June 23 (discharge, 3,760 second-feet); minimum, 1.75 feet at 5.30 p. m. September 2 (discharge, 56 second-feet).

Ice.—Stage-discharge relation usually affected by ice.

Accuracy.—Stage-discharge relation probably permanent throughout the year. Rating curve fairly well defined between 100 and 5,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying daily mean gage height to rating table. Results fair.

Discharge Measurements of Slippery Rock Creek at Wurtemburg, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
31	Apr. 26	J. M. Snavely	2.49	230
32	July 30*	H. J. McIntyre	2.25	170

* Measurement made by wading 400 feet below gage.

Daily Mean Gage Height, in feet, of Slippery Rock at Wurtemburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.62	2.08	2.48	2.62	3.41	3.20	3.85	3.74	2.46	2.85	2.18	1.91
2	2.86	2.08	3.67	3.24	2.88	3.37	3.49	3.18	2.28	2.56	2.14	1.78
3	2.62	2.20	3.60	3.53	2.75	3.95	3.15	2.92	2.20	2.34	2.47	1.95
4	2.31	2.29	3.10	2.98	2.70	3.77	2.95	2.88	2.18	2.21	2.42	1.98
5	2.17	2.14	2.95	2.84	3.05	3.72	2.78	2.88	2.15	2.11	2.28	2.20
6	2.10	2.11	3.00	2.72	3.78	4.08	2.71	2.96	2.09	2.05	2.10	2.50
7	2.10	2.06	2.83	2.68	3.68	4.57	2.60	2.72	2.05	2.05	2.39	2.39
8	2.05	2.09	2.63	3.36	3.80	4.35	2.59	2.58	2.00	2.08	3.62	2.28
9	2.02	2.08	2.51	3.52	3.78	3.97	2.90	2.44	2.05	2.20	3.16	2.15
10	2.02	2.14	2.43	2.96	3.72	3.89	3.17	2.42	1.98	3.44	2.59	2.16
11	2.00	2.21	2.48	2.76	3.46	3.41	3.22	2.34	2.00	3.24	2.35	2.63
12	1.99	2.22	2.54	2.73	3.32	3.25	2.97	2.30	2.00	3.26	2.45	3.48
13	2.00	2.11	2.58	2.51	3.15	3.36	2.80	2.34	1.96	3.08	2.95	2.79
14	1.98	2.12	2.86	2.70	3.18	3.25	2.82	2.37	2.02	2.61	2.65	2.45
15	1.97	2.09	3.52	2.76	3.25	2.98	3.02	2.34	1.94	2.60	2.51	2.26
16	1.97	2.04	3.53	2.73	3.27	3.19	3.03	2.24	1.94	2.54	2.35	2.30
17	1.99	2.12	3.26	2.52	2.52	3.54	2.97	2.17	1.96	2.34	2.24	2.32
18	1.96	2.26	2.92	2.55	3.24	3.17	2.89	2.20	1.96	2.20	2.26	3.32
19	1.97	2.39	2.60	2.50	2.93	3.05	2.69	2.15	1.96	2.23	2.51	3.04
20	1.95	2.70	2.55	2.42	2.85	2.92	2.57	2.15	1.98	2.30	2.31	2.63
21	1.98	3.21	2.53	2.44	2.64	3.13	2.56	2.13	1.91	2.30	2.20	2.59
22	1.98	3.07	2.70	3.16	2.64	3.29	2.52	2.11	2.27	2.16	2.10	3.22
23	1.95	3.02	3.10	4.49	2.66	3.06	2.55	2.10	4.44	2.07	2.10	3.10
24	1.96	2.91	3.20	3.73	2.64	2.87	2.63	2.10	3.26	2.03	2.08	2.72
25	1.98	2.85	3.20	3.10	2.68	2.92	2.49	2.40	3.05	2.00	2.00	2.61
26	1.97	2.78	3.00	2.72	2.69	2.85	2.46	2.48	4.60	2.00	2.03	2.58
27	2.06	2.64	2.88	2.76	2.64	2.92	2.40	2.28	3.77	2.00	2.00	2.52
28	2.10	2.54	2.87	2.60	3.52	3.13	2.65	2.48	3.20	1.98	1.99	2.40
29	2.19	2.46	2.82	2.56	------	3.68	3.14	2.45	2.93	2.05	2.01	2.34
30	2.20	2.36	2.82	2.78	------	3.35	4.28	2.40	2.96	2.20	1.98	2.32
31	2.15	------	2.54	3.68	------	3.38	------	2.51	------	2.35	1.98	------

Daily discharge, in second-feet, of Slippery Rock Creek at Wurtemburg, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	290	101	227	290	830	660	1,260	1,160	219	420	125	72
2	426	101	1,060	700	438	785	920	660	154	262	115	59
3	290	130	1,010	965	360	1,360	625	464	130	174	223	78
4	164	157	590	506	330	1,160	485	438	125	133	203	82
5	122	115	485	414	555	1,110	378	438	118	108	154	130
6	105	108	520	342	1,210	1,520	336	492	103	95	105	235
7	105	97	408	320	1,110	2,110	280	342	95	95	192	192
8	95	103	295	785	1,210	1,860	276	271	85	101	1,010	154
9	89	101	240	920	1,210	1,360	450	211	95	130	625	118
10	89	115	207	492	1,110	1,310	625	203	82	875	276	120
11	85	133	227	366	875	830	660	174	85	700	178	295
12	84	136	253	349	740	700	499	160	85	700	215	920
13	85	108	271	240	625	785	390	174	79	590	485	384
14	82	110	426	330	660	700	402	184	89	285	305	215
15	80	103	920	366	700	506	520	174	76	280	240	148
16	80	93	965	348	700	660	555	142	76	253	178	160
17	84	110	700	244	920	965	499	122	79	173	142	167
18	79	148	464	258	700	625	444	130	79	130	148	740
19	80	192	280	235	471	555	325	118	79	139	240	555
20	78	330	258	203	420	464	266	118	82	160	164	295
21	82	660	248	211	300	625	262	112	72	160	130	276
22	82	555	330	625	300	740	244	108	151	120	105	660
23	78	520	590	1,980	310	555	258	105	1,860	99	105	590
24	79	457	660	1,160	300	432	295	105	700	91	101	342
25	82	420	660	590	320	464	231	195	555	85	85	285
26	80	378	520	342	325	420	219	227	2,110	85	91	271
27	97	300	438	366	300	464	195	154	1,160	85	85	244
28	105	253	432	280	920	625	305	227	660	82	84	195
29	128	219	402	262	------	1,110	625	215	471	95	87	174
30	130	181	402	378	------	785	1,740	195	492	130	82	167
31	118	------	253	1,110	------	830	------	253	------	178	82	------

Monthly discharge of Slippery Rock Creek at Wurtemburg, for the year ending Sept. 30, 1921

(Drainage area 400 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
October	426	78	118	0.295	0.34
November	660	93	218	.545	.61
December	1,060	207	476	1.19	1.37
January	1,980	203	515	1.29	1.49
February	1,210	300	652	1.63	1.70
March	2,110	420	873	2.18	2.51
April	1,740	195	486	1.22	1.36
May	1,160	105	260	.650	.75
June	2,110	72	342	.855	.95
July	875	82	226	.565	.65
August	1,010	82	205	.512	.59
September	920	59	277	.692	.77
The year	2,110	59	386	.965	13.09

OHIO BASIN—STATION NO. 39

RACCOON CREEK AT MOFFATT'S MILL

Location.—At single-span steel highway bridge, about four miles west of Woodlawn, at Moffatt's Mill, Beaver County.

Drainage Area.—178 square miles.

Records Available.—May 27, 1915, to September 30, 1921.

Gage.—Standard chain attached to downstream side of bridge; read to half tenths twice daily by Henry Schissler.

Discharge Measurements.—Made from downstream side of bridge or by wading.

Channel and Control.—Both banks are high and not subject to overflow. Bed is composed of rocks and rock shingle; permanent. Control is at a riffle about 100 feet below gage. Stage-dischage relation may be affected by vegetable growth at control section during summer months.

Extremes of Discharge.—Maximum gage height during the year, estimated from hydrograph, 6.1 feet at 10 p. m. September 21; minimum, 1.65 feet at 7 p. m. October 17.

Ice.—Stage-discharge relation usually affected by ice.

Cooperation.—Station is maintained in cooperation with United States Engineer Office, Pittsburgh.

Discharge Measurements of Raccoon Creek at Moffatt's Mill, during the year ending Sept. 30, 1921

No.	Date	Made by—	Gage height	Discharge
			Feet	Sec.-ft.
9	May 16	J. M. Snavely	2.50	107
10	July 11*	H. L. Landis	2.56	81.3

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* Stage-discharge relation affected by grass on the control.

Daily Mean Gage Height, in feet, of Raccoon Creek at Moffatt's Mill, for the year ending Sept. 30, 1921

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.23	1.95	2.62	2.68	3.30	3.10	3.28	3.30	2.20	2.68	2.22	2.05
2	2.68	2.02	3.40	3.02	3.10	3.10	3.18	3.05	2.15	2.42	2.20	2.05
3	2.12	2.10	3.18	2.92	2.92	3.18	3.05	2.98	2.22	2.35	2.92	2.10
4	2.05	2.08	2.92	2.82	2.90	3.08	2.95	2.98	3.05	2.32	2.52	2.25
5	2.00	2.02	2.82	2.72	3.08	3.05	2.88	3.15	2.52	2.22	2.22	3.15
6	2.00	2.00	2.72	2.65	3.92	3.75	2.78	3.12	2.35	2.12	2.15	2.60
7	1.95	1.95	2.62	2.68	3.50	4.78	2.68	3.02	2.20	2.05	2.38	2.80
8	1.90	1.95	2.52	3.40	3.50	4.00	2.68	2.92	2.18	2.00	3.35	2.35
9	1.95	1.92	2.45	3.38	3.70	3.58	2.75	2.82	2.15	4.02	2.55	2.30
10	1.92	1.90	2.48	3.02	3.78	3.48	2.72	2.72	2.12	2.90	2.35	2.75
11	1.90	1.95	2.50	2.82	3.92	3.38	2.65	2.60	2.10	2.85	2.28	2.80
12	1.85	1.95	2.50	2.65	3.55	3.20	2.60	2.58	2.08	2.80	2.48	3.02
13	1.88	1.98	2.45	2.55	3.32	3.10	2.55	2.55	2.05	2.88	2.45	2.58
14	1.92	2.00	2.50	2.92	3.20	3.00	2.55	2.52	2.05	2.50	2.32	2.48
15	1.92	2.00	2.82	3.00	3.00	2.95	2.55	2.48	2.00	2.45	2.40	2.38
16	1.88	2.08	2.72	2.70	2.88	2.90	2.50	2.45	2.00	2.48	2.40	2.25
17	1.70	2.28	2.62	2.60	2.80	2.88	2.50	2.42	2.00	2.38	2.45	2.20
18	1.78	2.60	2.52	2.52	2.68	2.82	2.48	2.40	1.98	2.28	2.85	2.20
19	1.82	2.48	2.48	2.42	2.62	2.80	2.45	2.38	1.95	2.20	2.68	2.18
20	1.82	2.55	2.50	2.68	2.65	2.75	2.45	2.35	1.95	2.18	2.58	2.10
21	1.90	3.18	2.42	2.72	2.52	2.75	2.40	2.30	1.90	2.12	2.45	3.92
22	1.90	2.90	2.50	2.95	2.68	2.70	2.42	2.25	1.90	2.08	2.25	4.75
23	1.90	2.78	3.30	3.90	2.75	2.68	2.45	2.25	2.10	2.00	2.12	3.45
24	1.90	2.68	2.90	3.28	2.72	2.65	2.42	2.30	2.02	1.98	2.20	3.12
25	1.95	2.58	2.78	2.90	2.00	2.65	2.40	2.90	1.95	1.95	2.18	3.10
26	1.92	2.50	2.92	2.72	2.62	2.62	2.40	2.75	3.88	1.90	2.30	3.02
27	2.05	2.48	2.85	2.88	2.78	2.60	2.45	2.50	3.38	1.88	2.25	2.80
28	2.50	2.42	2.68	2.75	3.30	2.78	2.92	2.45	3.50	1.88	2.15	2.72
29	2.18	2.38	2.65	2.80	-------	3.18	3.25	2.45	3.38	2.72	2.12	2.60
30	2.08	2.38	2.90	2.98	-------	2.98	3.62	2.42	3.05	2.60	2.10	2.70
31	2.00	-------	2.68	4.08	-------	2.92	-------	2.32	-------	2.35	2.05	-------

TABLE NO. IX

Miscellaneous Discharge Measurements made during the year ending September 30, 1921

Stream	Location	Date	Gage height	Dis-charge	Drain-age area	Run-off Second-feet per square Mile
			Feet	Sec. ft.	Sq. Mi.	
Lackawaxen River	Hawley, Wayne County	June 29	0.42	65.1	290	0.224
Lackawaxen River	Hawley, Wayne County	Sept. 15	.16	50.6	290	.174
Bald Eagle Creek	Tyrone, Blair County	June 29	13.84*	26.6	48	.554

* Below reference points.

TABLE NO. X

Summary of Run-off in Second-feet per Square Mile, Run-off depth in inches, Precipitation and Per Cent run-off to Precipitation, for the Year ending September 30, 1921

Delaware Basin

Station	Run-off in Second-feet per Square Mile													Run-off	Precipitation	Per cent
	Drainage Area	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year	Depth in inches	Depth in inches	Run-off to Precipitation
Wallenpaupack Creek at Wilsonville	227	2.38	2.27	4.60	1.54	1.47	4.98	1.94	1.58	0.767	0.815	0.416	0.284	1.93	26.20	38.9	67.4
Delaware River, at Port Jervis, N. Y.	3,100	2.10	2.91	4.19	1.36	.981	5.97	2.54	1.69	.410	.594	.500	.291	1.98	26.79	40.0	67.0
Bushkill Creek near Shoemakers	115	1.83	1.66	3.97	2.19	1.32	5.51	4.59	2.85	.593	.477	.310	.226	2.14	29.02	45.3	64.1
McMichaels Creek near Stroudsburg	62	1.32	1.58	3.82	2.21	1.53	5.50	3.42	2.82	.982	.760	.524	.473	2.10	28.34	48.2	58.8
Lehigh River at Tannery	335	1.74	2.18	4.30	1.67	1.40	6.36	3.76	3.22	.761	.934	.842	.484	2.32	31.46	45.3	69.4
Lehigh River at Bethelhem *	1,240	1.25	1.38	2.91	1.71	1.22	4.70	2.76	2.42	.671	.855	.592	.377	1.75	23.71	44.1	53.8
Delaware River at Riegelsville †	6.430	1.60	2.08	3.56	1.54	1.16	5.21	2.58	1.93	.583	.746	.568	.398	1.84	24.96	42.1	59.3
Little Schuylkill River at Tamaqua ‡	44	2.03	2.22	4.57	2.52	2.12	6.48	3.66	3.27	.805	1.10	.968	.500	2.55	34.37	48.8	70.4
Schuylkill River at Reading ‖	900	.957	1.03	2.54	1.38	1.32	3.44	1.76	2.66	.498	.847	.473	.342	1.44	19.62	44.0	44.6
Bradywine Creek at Chadds Ford	285	.621	.828	1.31	1.35	1.12	1.67	1.19	1.53	.740	.670	.523	.346	.993	13.48	35.0	38.5

* Run-off does not include the water diverted past the gage through the Lehigh Coal and Navigation Company Canal. Canal was closed Dec. 2 to Apr. 17.

† Run-off includes 230 second-feet, estimated quantity of water diverted past the gage through the Delaware Division of the Pennsylvania Canal. Canal was closed Dec. 14 to Mar. 1.

‡ Run-off includes the quantity of water diverted from the stream by the Panther Valley Water Company.

‖ Run-off does not include the water diverted past the gage through the Schuylkill Navigation Company Canal. Canal was closed Dec. 12 to May 31.

TABLE NO. XI

Summary of Run-off in Second-feet per Square Mile, Run-off depth in inches, Precipitation and Per Cent run-off to Precipitation, for the Year ending September 30, 1921
Susquehanna Basin

Station	Drainage Area	Run-off in Second- feet per Square Mile													Run-off	Precipitation	Per cent
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year	Depth in inches	Depth in inches	Run-off to Precipitation
North Branch Susquehanna River at Towanda	7,770	0.937	1.26	2.59	0.834	0.898	3.73	1.58	0.959	0.219	0.318	0.274	0.206	1.16	15.70	33.5	46.9
Towanda Creek near Monroeton	218	.583	1.67	2.44	.716	1.30	4.00	1.93	1.18	.154	.137	.067	.092	1.19	16.15	25.6	45.4
Tunkhannock Creek at Dixon	393	1.66	2.52	3.31	.972	1.20	4.55	1.78	.728	.141	.202	.179	.130	1.45	19.73	37.0	53.3
Lackawanna River at Moosic	265	1.64	2.60	3.48	1.34	1.25	4.79	2.23	1.62	.592	.932	.551	.457	1.80	24.40	36.8	66.3
North Branch Susquehanna River at Wilkes-Barre	9,960	1.01	1.33	2.43	.809	.971	3.56	1.70	1.05	.244	.315	.257	.186	1.16	15.84	34.1	46.5
Wapwallopen Creek near Wapwallopen	46	.950	1.63	2.30	.952	1.37	3.41	1.67	1.88	.487	.313	.541	.322	1.32	17.94	44.8	40.0
Nescopeck Creek near St. Johns	49	1.30	2.78	3.76	1.21	1.45	5.53	2.33	2.71	.996	.959	1.17	.451	2.06	28.02	47.1	59.5
Fishing Creek at Bloomsburg	355	.910	1.95	3.66	1.20	1.47	4.85	2.58	1.93	.414	.344	.673	.806	1.74	23.59	42.6	55.4
North Branch Susquehanna River at Danville	11,200	1.03	1.33	2.62	.882	.991	3.79	1.71	1.12	.293	.353	.321	.238	1.23	16.69	35.2	47.4
West Branch Susquehanna River at Bower	320	.562	1.99	2.01	2.44	2.56	3.81	.838	1.96	.288	.303	1.62	1.20	1.63	22.14	42.8	51.7
Clearfield Creek at Dimeling	370	.681	1.88	1.65	1.78	2.63	3.35	.997	2.14	.395	.519	1.59	.941	1.50	20.31	46.5	43.7
Driftwood Branch Sinnemahoning Creek at Sterling Run	270	.277	1.55	1.63	1.29	1.68	3.34	1.81	1.40	.459	.177	.314	1.46	1.28	17.35	40.4	42.9
West Branch Susquehanna River at Renovo	2,990	.622	1.71	1.96	1.42	1.78	3.48	1.61	2.18	.699	.388	.910	1.30	1.51	20.43	43.6	46.9
Bald Eagle Creek at Milesburg	140	.371	1.95	2.26	1.42	1.52	3.10	1.77	2.32	.301	.363	.456	.800	1.39	18.85	42.1	44.8
Bald Eagle Creek at Beech Creek Station	565	.784	1.82	1.88	1.39	1.72	3.10	1.81	2.46	.811	.604	.743	.786	1.49	20.26	40.9	49.5
Pine Creek at Cedar Run	590	.288	.649	1.58	.788	1.14	3.22	1.90	1.34	.290	.256	.198	.524	1.02	13.77	32.7	42.1
Lycoming Creek near Trout Run	185	.242	.946	1.96	.735	.908	3.81	2.23	1.42	.330	.239	.176	.331	1.11	15.14	38.0	39.8
West Branch Susquehanna River at Williamsport	5,670	.552	1.53	2.08	1.26	1.73	3.56	1.87	2.26	.690	.413	.725	.951	1.47	19.95	40.6	49.1
Frankstown Branch Juniata River at Williamsburg	295	.597	1.37	1.62	1.61	1.56	2.51	.990	2.53	.505	.797	.980	.553	1.31	17.71	41.3	42.9
Raystown Branch Juniata River at Saxton	790	.324	1.15	1.41	1.51	1.48	2.38	.675	2.34	.409	.703	.458	.380	1.10	14.97	38.7	38.7
Tuscarora Creek near Port Royal	205	.427	1.40	2.06	.917	1.29	2.18	1.23	3.76	.378	.362	.162	.326	1.21	16.44	40.7	40.4
Juniata River at Newport	3,380	.669	1.39	1.72	1.14	1.43	2.41	1.06	3.05	.556	.568	.491	.456	1.25	16.93	40.0	42.3
Susquehanna River at Harrisburg	24,100	.810	1.34	2.35	.967	1.24	3.31	1.59	1.85	.473	.377	.427	.394	1.27	17.15	37.8	45.4
Little Swatara Creek near Pine Grove	34	1.01	1.64	3.53	1.88	1.97	4.47	1	3.74	.326	.356	.335	.156	1.78	24.15	43.1	56.0
Swatara Creek at Harpers	334	.931	1.27	3.44	1.34	1.51	3.68	1.92	3.35	.389	.344	.241	.172	1.56	21.11	40.2	52.5

TABLE NO. XII

Summary of Run-off in Second-feet, per Square Mile, Run-off depth in inches, Precipitation and Per Cent run-off to Precipitation, for the Year ending September 30, 1921

Ohio Basin

Station		Run-off in Second-feet per Square Mile													Run-off	Precipitation	Per cent
	Drainage Area	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year	Depth in Inches	Depth in inches	Run-off to Precipitation
Allegheny River near Larabee	545															38.6	
Brokenstraw Creek at Youngsville	290	0.507	2.32	2.43	2.38	2.40	4.48	2.57	1.54	0.621	0.352	0.359	0.645	1.71	23.25	44.0	52.8
Tionesta Creek at Butler Bridge	420	.360	1.35	1.91	2.10	1.64	3.83	1.72	1.06	.531	.279	.232	.460	1.29	17.51	39.2	44.7
Oil Creek near Rouseville	330	.339	1.65	2.00	2.17	2.08	4.61	2.49	1.28	.342	.275	.219	.327	1.48	20.10	43.9	45.8
French Creek at Kimmeytown	207	.758	2.89	3.30	3.13	2.45	4.30	3.06	1.37	.599	.370	.294	.287	1.90	25.76	42.4	60.8
French Creek at Saegertown	586							2.95	1.44	.404	.442	.247	.304			43.2	
Cussewago Creek near Meadville	88	.145	2.30	3.07	2.33	2.58	4.09	2.28	1.14	.079	.078	.070	.065	1.51	20.56	45.6	45.1
French Creek at Carlton	1,000	.402	2.03	2.63	2.32	2.42	4.02	2.60	1.41	.340	.472	.312	.345	1.61	21.81	44.5	49.0
Allegheny River at Franklin	6,010	.373	1.60	2.21	1.96	1.98	3.76	2.23	1.46	.494	.414	.326	.614	1.45	19.68	40.7	48.4
Clarion River near Clarion	930	.440	1.24	1.67	2.35	2.43	3.10	1.91	1.33	.549	.383	.980	1.05	1.44	19.60	39.7	49.4
Red Bank Creek at Saint Charles	540	.737	1.45	1.63	1.34	1.61	3.67	1.66	1.06	.572	.439	.861	1.82	1.40	19.04	41.1	46.3
Mahoning Creek near Dayton	322	.773	1.94	1.98	2.32	2.47	3.63	.994	.950	.233	.247	.832	1.24	1.47	19.85	40.9	48.5
Allegheny River at Kittanning	9,010	.384	1.49	2.11	1.98	2.06	3.81	2.04	1.43	.437	.386	.446	.825	1.44	19.63	40.8	48.1
Crooked Creek at Hileman's arm	279	.534	1.73	1.81	2.64	3.13	3.43	1.01	1.43	.108	.123	.513	1.91	1.52	20.65	42.3	48.8
Stony Creek at Johnstown †	468	.620	1.26	1.88	3.01	2.74	3.65	.635	2.12	.502	.481	.769	1.54	1.60	21.69	45.5	47.7
Blacklick Creek at Blacklick	386	.578	1.68	1.67	2.64	2.36	3.16	.904	1.91	.505	.472	1.33	.979	1.52	20.53	43.5	47.2
Loyalhanna Creek at New Alexandria	264	.614	1.41	1.77	3.12	3.06	3.43	1.04	1.47	.784	.652	.511	1.47	1.60	21.77	47.6	45.7
Kiskiminitas River at Avonmore	1,720	.616	1.47	1.84	2.74	2.67	3.35	.930	1.78	.530	.496	.767	1.29	1.53	20.84	44.7	46.6
Casselman River at Markleton	365	.493	1.39	2.43	3.21	2.11	3.48	.866	2.49	1.09	.742	1.41	1.68	1.79	24.25	50.6	47.9
Laurel Hill Creek at Ursina	122	.552	2.02	2.94	4.49	2.79	3.98	.934	2.67	1.40	.558	1.29	2.16	2.15	29.17	52.7	55.4
Youghiogheny River at Connellsville	1,320	.498	1.37	2.45	3.43	2.33	3.48	1.01	2.71	1.10	.537	1.27	1.30	1.80	24.32	49.1	49.5
Youghiogheny River at Sutersville	1,680	.522	1.22	2.12	3.03	2.27	3.13	.976	2.13	1.02	.702	1.08	1.27	1.62	22.02	48.0	45.9
Turtle Creek near Trafford	55	.275	1.68	.916	2.84	2.44	3.69	.711	.711	1.82	1.16	.376	1.32	1.49	20.19	40.6	49.7
Chartiers Creek at Carnegie	260	.185	.415	.885	1.99	2.61	2.87	.988	.762	.267	.535	.565	1.33	1.11	15.04	40.5	37.1
Shenango River near Turnerville	152	.099	1.11	2.02	1.42	2.24	3.51	2.01	.717	.295	.113	.168	.311	1.16	15.77	42.7	36.9
Shenango River near Jamestown	182	.116	1.18	2.02	1.53	2.32	3.58	1.95	.747	.310	.135	.209	.385	1.20	16.31	42.6	38.3
Little Shenango River at Greenville	107	.200	.671	1.78	1.63	1.95	3.32	1.86	.808	.342	.458	.574	.437	1.17	15.84	44.4	35.7
Pymatuning Creek near Orangeville	170	.162	1.03	1.52	1.64	2.37	3.95	1.91	.647	.292	.306	.517	.332	1.22	16.53	35.2	47.0
Shenango River at Sharon	611	.109	.732	1.55	1.33	1.96	2.98	1.85	.753	.345	.301	.300	.283	1.04	14.08	39.3	35.8
Shenango River at New Castle ‡	797	.103	.611	1.47	1.18	1.87	2.76	1.77	.641	.260	.221	.247	.222	.941	12.78	37.6	34.0
Neshannock Creek at Eastbrook Station	235	.237	.506	1.18	1.30	1.63	2.43	1.37	.502	.613	.579	.596	.464	.945	12.86	38.2	33.7
Connoquenessing Creek near Hazen	355	.258	.673	1.29	2.10	2.53	2.87	1.19	.701	.727	.490	.355	.355	1.12	15.23	37.3	40.8
Slippery Rock Creek at Wurtemburg	400	.295	.545	1.19	1.29	1.63	2.18	1.22	.650	.855	.565	.512	.692	.965	13.09	38.5	34.0

† Run-off includes the quantity of water diverted from the Quemahoning Reservoir.

‡ Run-off includes the quantity of water diverted from the stream at the New Castle Water Works.

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